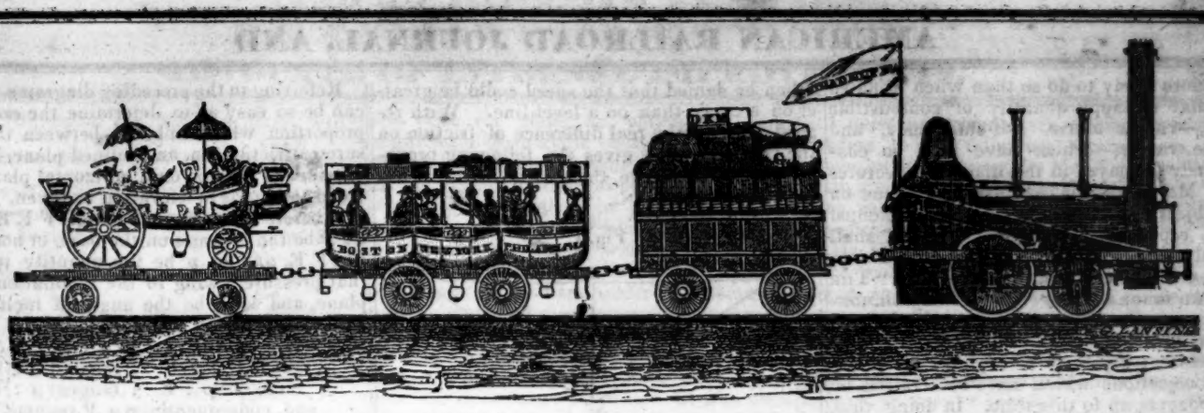

AMERICAN RAILROAD JOURNAL,
AND ADVOCATE OF INTERNAL IMPROVEMENTS.

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AMERICAN RAILROAD JOURNAL, &c.

NEW-YORK, MARCH 29, 1834.

The writer of the following will please accept our thanks for his very acceptable letter. Such favors come, at this time, most opportunely to hand.

The Athens Railroad, to which he refers, cannot fail to attract the attention of business men in this community, although it may not just now meet with such a reception as its importance demands. It is certainly a *second* link in a grand southern chain of internal improvements, from which the South will derive great advantages. It will enable the business man, or the man of pleasure, to perform the journey from New-York to Athens, with ease, in five, and probably in four days.

Athens, Ga., March 12, 1834.

Dear Sir,—I have been very much at a loss how to remit the subscription for the Railroad Journal. I have at last, however, procured notes that will probably answer your purpose,* and enclose my own subscription for the past and present year.

I enclose, also, three dollars, for which you will send the Journal to Mr. Wm. Dearing, of this place; also, to Wm. Lumpkin, and Wm. Williams.

I feel very much obliged to you for the favorable notices in the Journal on the subject of our Athens Railroad. The project is in a pretty fair way to be accomplished, if the proper energy is used. The route is, I think, one of the best in the United States, being formed in a good degree by nature. The distance from Augusta to Athens is about 96 miles by the present road: the railroad survey gives 105 miles only; and not a drop of water is crossed, but one or two very inconsiderable brooks. No inclined plane is necessary, except to ascend the hill on which Athens stands. The estimate is that the whole road, engines, cars, and all, will cost under *ten thousand dollars* the mile. We design using horse power, for the present, which it is believed will reduce the cost to five or six thousand per mile. The very best timber is at hand, and the soil is very favorable, being chiefly, except near Augusta, a stiff clay foundation.

Our purpose is to make this road a part of the great road beginning at Memphis and ending at Charleston; and if the road is ever finished through the whole distance, the profits, with good management, must be incalculable. It will command a large portion of western travel, and the transportation of an immense amount of produce.

Even if the road should stop at Athens, we calculate on a large amount of business from East and Middle Tennessee, North Alabama, and the counties in this state above us. We have near this place inexhaustible deposites of iron ore, limestone, and marble, which will furnish articles of export, in addition to what is now supplied by the cotton planters.

It seems to me that this road must be an object of interest to the people of the city of New-York. The trade of great part of East and Middle Tennessee goes to Baltimore and Philadelphia; but when this road is built, by means of the Charleston road, and steam packets, it will certainly find its way to New-York. Those interested in the prosperity of that city, therefore, would certainly employ their capital to good advantage, independent of the income of the stock, by vesting it in this undertaking. Whether an opportunity of making such investment will be offered, I cannot say. I hope the stock will be all taken at home.

By reference to a map of Georgia, you will at once see the indications of a favorable route for an improvement of this sort. Begin at Augusta; keep the ridge between Little River and the Ogeechee to near Warrenton; thence on the same ridge to Crawfordville, and so proceeding near Greenesborough and Lexington, you will see that until we arrive at the river at Athens, not a single bridge will have to be built; and the Engineer reports the excavation and embankment to be very little, compared with what has been done on other routes.

Very respectfully, &c.

P. S.—The officers of our Railroad are:

President—James Camak.

Directors—Wm. Dearing, Wm. Williams, A. B. Linton, Rev. James Shannon, J. A. Cobb, E. L. Newton, John Nisbet, Wm. Lumpkin, W. R. Cunningham, of Athens; John Cunningham, of Greene; R. B. Thompson, A. Janes, of Talliaferro.

Secretary and Treasurer—Wm. Williams.

* U. S. Branch notes, which are as good to us as gold.—[Ed.]

The Undulating Railway—Resistance from Friction—Resistance of the Atmosphere—Mr. Badnall in reply to S. Y., Junius Redivivus, and Mr. Cheverton. [From the London Mechanics' Magazine.]

Sir,—Seven months have now elapsed since the undulating railway was first introduced, as a subject of discussion, in your Magazine. During that period I have done my utmost, by fair and conscientious argument, to support the cause which I undertook to defend; and the gratification which I now feel in having witnessed your honorable and candid confession of a changed opinion, and in finding myself supported by several of your most able correspondents, far more than compensates for the disappointment which the opposition of "S. Y." would naturally excite, even should it be continued after the publication of this letter, and after the important facts determined by the experiments. I say *disappointment*, because, if still unconvinced, he will, I fear, ever remain inconvincible; and, judging from the occasional piquancy and asperity of his remarks, he is not likely to be more fairly defeated, without losing, in some measure, that evenness of temper which I should be sorry to disturb. If I do him injustice, I apologise for it; but I feel that the time is now arrived when (practical experiments having decided the merits of the question) I have no longer occasion to defend myself by parrying the verbal attacks of my opponents. On the contrary, I waive all further hypothetical discussion on this subject, unless such discussion refer to the result of my late or future experiments. In coming to this conclusion I am not considering my own convenience, but I think your readers in general will agree with me, and with your friend, *Professor Crackwell*, that unless we draw in our horns, the undulating controversy will not only become sickening, but, judging from Mr. Cheverton's last letter, somewhat disgusting. "*Nec lusisse pudet, sed non incidere ludum*," said Horace, and I quite agree with him.

You, Mr. Editor, or an impartial jury of your readers, must judge whether I am led to this train of thinking through *fear* of my opponents, or whether I am not justified in claiming the victory I have contended for. Those gentlemen who have advocated my side of the question—*Saxula, Mr. Ham, Mr. Sanderson, Kinclaven, Mentor*, and *Mr. Trebor Valentine*, have each and all supported my position by convincing diagrams, appropriate comparisons, or disproved experiments; whereas neither "S. Y." nor Mr. Cheverton have thought proper to substantiate their reasoning by a single particle of corroborative evidence. That both are clever men, I do not for one moment question; but a clever man occasionally errs; and never

is he more likely to do so than when inflated with that unhappy quantity of combustible matter,—vulgar abuse, self-sufficiency, and extreme vanity,—which have been so conspicuously displayed in the disjointed lectures which Mr. Cheverton has directed to me on this subject. For those lectures I am indebted to him, especially for the last, which I shall presently take into consideration, and which, I trust, will be headed in your title-page, "THE PROFOUND IGNORANCE OF MR. BADNALL DEMONSTRATED BY THE SUPREME SENSE OF MR. CHEVERTON"!!

My present object is to reply to all unanswered objections which have been raised by my opponents up to this time. In doing this, I may probably introduce some opinions which may appear open to further discussion; but as I fully concur in the sentiments expressed by . μ. (No. 532), as to the frequently injurious effects of a too protracted controversy, I shall feel it an act of duty to your readers to be a silent observer of any attacks upon them. I place them on record as my deliberate and conclusive opinions; and having done so, I turn from *theory* to *practice*, and now present myself to your readers as the defender of the undulating principle in a far more important point of view—I mean in defence of its *complete practicability*.

In thus a second time throwing the glove, allow me to prognosticate what will be the result of another year's experience. Within that period, engineers and mathematicians will have an opportunity of making up their minds upon the subject, and from the expiration of that time *we shall never have another level railway* (whereon locomotive steam force is intended to be employed) *laid down in Great Britain*. The Liverpool and Manchester railway, though it will ever maintain the character of being one of the most important examples of British spirit, British perseverance, and British ingenuity, will, in the eye of posterity, have one dark spot upon its fame—it will be compared to the massive and expensive aqueducts of the ancients. Our forefathers knew not that water would find its own level—and, while we praise their structures, we cannot help wondering and smiling at their ignorance. Thus, however, will posterity smile at us, exclaiming, "*Could you have believed it! They expended, in about thirty-one miles, hundreds of thousands of pounds to make a railroad level*, through their disbelief *that all bodies descending on a curvilineal arc will rise again to their own level, minus friction!*"

I now turn to "S. Y."—a few words afterwards to Junius Redivivus; and then, in perfect good humor, to Mr. Champion Cheverton.

A desire to remove, if possible, every opposition founded on mathematical reasoning, which has been urged against the undulating theory, induces me to return to "S. Y.'s" first communication. Before doing so, however, I must at once contend against the liberty which he takes in stating that I have betrayed ungentlemanlike conduct by my observation, "that I should have felt hurt that any other correspondent than himself had doubted my proficiency in common arithmetic." The "indignation" of "S. Y." cannot possibly justify such an observation.

In "S. Y.'s" letter, page 181, there is an error in print, afterwards corrected, which rendered his first formula "incomprehensible." I allude to the omission of the decimal dot before the figure 8. In the succeeding column, however, I find this misprint did not occur; I therefore ought to have understood his object better than I did. But allowing that I had fully comprehended it, and that such misprint had not occurred, I observed that the whole formula was founded on false data, and that the position which he took was altogether untenable. I refer now to the saving of friction "*abstractedly*," without allusion to the difference in velocity occasioned by the action of gravity, to which latter point he also frequently alluded, when he denied that the speed could be greater on a curve than on a level line. With regard, then, to the real difference of friction on the two roads, he gives the following proposition, which I have thought it better to describe by diagram:

Fig. 1.

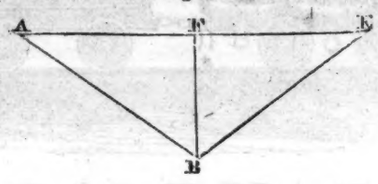
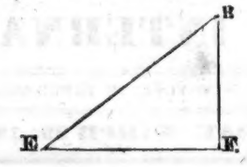


Fig. 2.



"If A E (fig. 1) be equal to 16, and the depth F B equal to 6, the length of each inclined plane will be equal to 10, and the pressure against the plane; and therefore the friction, according to Mr. Badnall, will be equal to ·8 of the friction on the level."

Now "S. Y." must have misunderstood my diagram, *p. 93, to which he refers, and which was, I think, clearly elucidated. If he *did understand it*, from whom did he draw his conclusion, that I imagined the friction or pressure on the inclined plane E B, whose perpendicular elevation is equal to F B, equal to ·8 of the friction on the level?

Let him suppose, then, (reversing the above diagram, as fig. 2,) the plane E B raised upon the base E F, at an elevation of F B. It cannot be doubted (as proved by the parallelograms described in my diagram, page 93,) that if the base line E F represent the pressure (or friction) of the whole weight resting on the plane E B, F B will represent the force of gravity down the plane, or, in other words, as the length of the line F B is to the length of the line E F, so is the pressure or friction taken *off* the inclined plane E B to the pressure or friction *left on the inclined plane*; or, to be more explicit, if a body be supposed to weigh 10 tons, and to be placed on the horizontal line E F, no one can dispute that, the line of pressure being vertical, the *whole weight of the mass* must necessarily press upon the rail. If, then, E F were exactly equal to F B, and the weight were removed to the inclined plane E B, the pressure would be reduced *one half*; and thus, in the above diagram, E F being equal to 8, and F B equal to 6, and supposing any weight resting on E B to be divided into 14 parts, $\frac{8}{14}$ths of the whole weight would be resting on the rail, and $\frac{6}{14}$ would be taken *off* the rail.

By this explanation it will be evident that "S. Y.'s" second formula, page 242, is, like to his first, established on wrong data, *for he never takes into consideration the perpendicular elevation of the plane*; and it is this which has evidently misled him, or otherwise he would not consider his argument to hold good for "all lengths and *elevations* of inclined planes."

"S. Y." considers in both formulæ the pressure to be determined by the *base*, divided by the *length of the inclined plane*: he consequently draws in each case an erroneous conclusion, for there can be no doubt whatever that, *as the perpendicular height of the inclined plane is increased, the pressure or friction of any carriage moving on that plane is reduced.*

* On referring to this diagram I find the length of the level line E A=22, the length of each inclined plane=5† and the elevation=2·5; if, therefore, we deduct 2·5 from the length of F A, we shall find the reduction of friction or pressure nearly one-fifth.

Referring to the preceding diagrams, nothing can be so easy as to determine the *exact* proportion which subsists between the pressure or friction on an inclined plane, and the pressure or friction on a horizontal plane, provided the angle of elevation be given. In the case before us we have the angle F E B. Now, let P be the pressure on the base, or horizontal line F E, and let p be the quantity taken off that pressure, owing to the inclination of the plane, and let a be the angle of inclination: we then have *in all cases*—

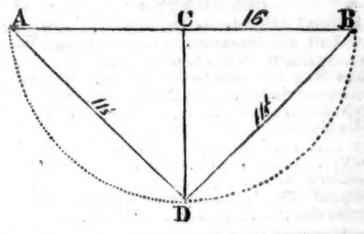
$$p : P :: F B : F E$$

but F B : F E :: tangent a : 1

therefore p : P :: tangent a : 1

and, consequently, p : P tangent a.

If, then, the amount of friction or pressure on an inclined plane (speaking abstractedly of friction or pressure) be reduced in proportion to the angle of inclination, it must, I should hope, be evident to "S. Y." that his position is wrong. He, no doubt, will allow that the pressure at an angle of 45° is reduced *one half*. To make myself, therefore, perfectly clear, I will take this angle to prove his formulæ *incorrect*, and the undulating theory, *in regard to friction, perfectly correct*:



Draw the line A B, and divide it into 16 equal parts. From the centre C describe the semicircle A D B. Draw the line C D perpendicular to A B, and from the points A and B draw the straight lines A D, B D.

Now, as before observed, because the perpendicular line C D is equal to the line B C, any weight descending on the line B D will press with exactly half the force with which it would have pressed on the level line A B, the angle C B D being an angle of 45°. Divide, then, the lines B D, A D, into an equal number of parts, each part being equal to $\frac{1}{16}$th of the horizontal line A B=22½. Next suppose a body, weighing 10 tons, to press upon every described part of the line A B, in passing from A to B: we then have 16×10=160; but if 10 tons press upon each part of the horizontal line, *half that weight*, according to the proposition, will only press upon each part of the lines B D, A D.

We have, therefore,

$$22\tfrac{3}{8}\times 5=112$$

and, consequently, 160—112=48 difference in total pressure.

But it may be argued, that if the semicircle A D B were divided into an equal number of like parts, the total number to be passed over on the curve would be 25·142; but this argument will not obtain, it being mathematically true (see Sir Isaac Newton, Parkinson, Hutton, and others,) that the velocities which bodies acquire in falling either down inclined planes, or curvilineal arcs, are precisely alike, viz. as the square roots of their perpendicular heights; and if the acquired velocities are equal, it is self-evident that the resistance opposed to motion down each line is also equal.

Let us now examine to what result "S. Y.'s" formulæ would bring us.

Let B represent B C

L " B D

n pounds equal to the force of traction on a level at any given velocity.

Then the pressure on the line B D (according to "S. Y.") will be to the pressure on the level as $\frac{B}{L}$ is to 1; and therefore the force of traction required in conse-

quence of friction on the inclined plane, will be to the force of traction on the level as $\frac{B}{L}n$ is to n. According, then, to "S. Y.," the entire expenditure of power to move the wheel the horizontal distance on the level will be Bn, and on the inclined plane it will be $\frac{B}{L}n \times L = Bn$ as before. Thus he makes, at an angle of 45°, the pressure or friction on the lines A D and B D equal to the pressure or friction on the horizontal line A B; whereas I make the difference in friction as 7 to 10, or $\frac{3}{10}$ths in favor of the semicircle A D B.

Again, referring to "S. Y.'s" letter (No. 531), wherein h. fully explains the bearing of his formulæ, the erroneous view which he has taken of the question is again evident. For, taking 5 ounces (as he suggests) to represent the force of traction on the level, and applying his observations to the angle of 45°, we shall find that the calculation will not be, as it would arise if his formulæ were correct, viz. $16 \times 5 = 80$ on the level, and $22{\cdot}40 \times {\cdot}71428571 = 15{\cdot}999$, or very nearly 16; consequently, $16 \times 5 = 80$ on the inclined plane, as before.

But, instead of the force of traction on the semicircle being equal to the force of traction on the horizontal line, we should have it as follows:

$16 \times 5 = 80$ on the level,
$22{\cdot}40 \times 2{\cdot}50 = 56$ on the curve,

precisely agreeing with the reduction of friction before mentioned, viz. $\frac{3}{10}$ths in favor of the semicircle.

So much for the question of friction, considered abstractedly, and as *commonly* understood; but it must be evident to every man who has perused the particulars of the experiments, that the amount of reduced friction, as in this instance considered, according to the angle of the inclination of the plane, cannot be taken as the precise measurement of power saved, by the adoption of the undulations. On these interesting points I trust that some valuable information may shortly be laid before the public in a treatise on railways,* locomotive engines, &c., which Mr. Robert Stephenson, son., and myself, are preparing for the press. Previously to that time we shall try various experiments, and I have no doubt, from the plans which we intend adopting, and the precision with which the experiments will be made, that the laws of motion and resistance, under various circumstances and velocities, will be more clearly developed than they have hitherto been. The results which I anticipate lead me to quote a remark of Hooke's in the year 1666: "Gravity, though it seems to be one of the most universal, active principles in the world, and consequently ought to be the most considerable, yet has it had the ill fate to have been always, till of late, esteemed otherwise, even to slighting and neglect."

I have no apology to make to "S. Y." for considering L as a proper symbol for the *length* of the plane, which was ascended with a given velocity, especially as the spaces in most of the experiments varied on every trial. For an error in the last equation I, however, have to apologise, and I must beg "S. Y." to read L+D for L D—. The word "INVERSE," which he alludes to in his letter (No. 531, p. 23,) was an unintentional omission of mine (see page 222), where, for "*is in proportion*," I evidently intended to say, "*is in inverse proportion*." Any person who reads the sentence will, I hope, give me credit for this.

In reply to the observation of Junius Redivivus, (No. 532, page 38,) let me beg him to place a heavy ball upon a plank, then raise the plank to a vertical position—he will allow that, because the weight falls perpendicularly, there is *no pressure* on the plank. Let him, then, raise the plank on which the same weight rests to an angle of 45°. He will, no doubt, admit that the weight will descend, and that the velocity of descent on the effect of the force of gravity will be in proportion to the diminution of pressure or friction on the plank. Let him next support the weight on the plank (the latter still being inclined at an angle of 45°), by placing his hand under it, or some machine by which he can accurately measure the pressure: he would, I have no doubt, find that precisely *half* the weight was resting *on the plank*, and *half* the weight *upon his hand*, or upon the instrument by which he was measuring the pressure. Let him, then, withdraw his hand, and what becomes of the weight? Half is still remaining on the plank, and the other half is suspended in the atmosphere until it reach the earth which attracts it. Surely, on consideration, Junius Redivivus will acknowledge the truth of this reasoning, and if so, he cannot dispute that the greater the angle of the inclination of the plane the less will be the pressure or friction of any body, either ascending or descending, on such plane.

And now for Mr. *Champion Cheverton!*

The first explanation which I think due from me to your readers, and to which "*The Champion*" principally alludes, is in reference to *the resistance of the air*. I stated, in a former letter, that I thought that *the resistance of the atmosphere* did not (a constant power being employed to urge the body forwards, or, like gravity, downwards,) increase as the squares of the velocity—that the resistance of the air does not act as a greater opposing force (alluding, particularly, to the flight of birds, and to the motion of railway carriages,) at high velocities than at low velocities—that, consequently, the velocity of a train of carriages, supposed to be descending an inclined plane of interminable length, *never could in practice become uniform*; but, on the contrary, that in *theory* the uniform acceleration would not begin to cease until the resistance of the air was equal to the force of descent, which it could not be until the body had attained a velocity equal to that at which air would rush into empty space. I further stated, that it was my opinion "that the resistance of the air, when first overcome by any locomotive force which is constantly and equally *continued*, does not, throughout EQUAL SPACES OF DISTANCES, act as an opposing force with greater intensity at high velocities than at low velocities"; but that, on the contrary, it was my opinion that the *total resistance* of atmosphere, throughout a *given distance*, is *less* at high velocities than at *low velocities, from the inclination* which all bodies have to rise from the surface of the earth *when in rapid motion*, and, consequently, from a denser to a lighter atmosphere.

Now, sir, I should have felt not only that an explanation, but that a public apology was due from me, had I published these opinions, without having *very strong reasons* for believing them to be true. I know they are diametrically opposite to received opinions: *so was the undulating railway*; but time, and careful experiments, will prove whether I am right or wrong. I will now explain my reasons for believing that *I am right*.

In the first place, that there are many doubts existing as to the *true* theory of atmospheric resistance is evident, by the following remark by Hutton: "We conclude (he says) that all the theories of the resistance of the air hitherto given are very erroneous, and the preceding one (alluding to the generally entertained opinion) is only laid down till further experiments on this important subject shall enable us to deduce from them *another* that shall be more consonant to the true phenomena of nature." Surely this admission is a sufficient apology for the humble attempt which I have made, and for the attempt which Mr. R. Stephenson and myself are now making, to investigate this subject.

I must now request the attention of your readers to the following experiments, tried down inclined planes, by Mr. Nicholas Wood, with a view of measuring the friction of railway carriages. (See his work on Railways, 2d edition, pp. 211–213, &c. &c.)

Mr. Wood, in reference to these experiments, thus writes: "Standing on the end of a carriage, and aided by an assistant, at the end of every ten seconds I made a mark upon the plane where the carriage happened to be, and afterwards measured the distance between those marks, which gave the space passed over in each successive period."

Carriage weighing 9,100 lbs.; wheels, 34 inches; axle, 2¼; friction, 44·62 lbs.

Seconds.	Feet.	Real space, the descent not being uniform.
In 10 the body fell	6·6	6· feet.
20	26·4	26·4 "
30	59·4	59·8 "
40	105·6	106·2 "
50	165	165 "
60	237·6	242·8 "
70	321·4	326·7 "
80	422·4	424·3 "
90	534·6	525·3 "
100	660	635·5 "

The above experiment was tried at the Kenilworth colliery.

Now, in examining the result of this experiment, if Mr. Wood were correct in his measurement, and upon his correctness I have placed dependence, it is evident that the resistance of the atmosphere did not increase as the squares of the velocity of the moving body, but that, *for some reason or other*, with which reason the public will soon, if I mistake not, be acquainted, it was equable in effect through equal spaces throughout the entire distance of descent.

We know that if a body fall, in vacuo, a given space in the first second of time, it will have fallen four times the space in the two first seconds; that if it fall 16·1 in one second, it will have fallen 64·4 in two seconds; because $16{\cdot}1 \times 4$ (4 being the square of the times) $= 64{\cdot}4$.

Again, if it fall 1608 feet in 10 seconds, it will fall 6433 feet in 20 seconds, or twice the time; because (omitting fractions) $1608 \times 4 = 6432$.

Now it appears, according to Mr. Wood's *measured* experiments, that in 10 seconds the carriage fell 6·6 feet, and in 20 seconds 26·4.

Now $6{\cdot}6 \times 4 = 26{\cdot}4$, which is in exact accordance with the laws of falling bodies.

Again, in 40 seconds, the carriage fell 105·6, and in 80 seconds 422·4.

Now $26{\cdot}4 \times 4 = 105{\cdot}6$
and $105{\cdot}6 \times 4 = 422{\cdot}4$.

Again, in 30 seconds it fell 59·4, and in 60 seconds 237·6.

Now, $59{\cdot}4 \times 4 = 237{\cdot}6$.

Lastly, in 50 seconds it fell 165, and in 100 seconds 660;

and $165 \times 4 = 660$.

Now, had the resistance against the rolling carriage increased as the squares of velocity, the descent *could not have been in accordance with the laws of bodies falling in vacuo*.

I will, however, refer to other experiments, and try the question by another test:

Descent of loaded carriages weighing 9,408 lbs.; wheels, 35 inches diameter; axles, 3 inches.

In 18 seconds the carriage fell	25 feet
28	71·9 "
38	124·6 "
48	205·2 "
58	276·5 "
68	384·7 "
78	506·1 "
88	645·5 "
98	785·3 "
108	939·6 "
118	1081·6 "
128	1266·5 "

Fall, 1 in 104—friction, 41·45 lbs.

Now, in vacuo (taking 16 ft. as the correct measurement in the first second of time), a body in 18 seconds would fall 5210·892 feet, and in 28 seconds 12608·072 feet, and in 38 seconds 23223·852. Now, according to the preceding experiment, the carriage fell 25 feet

* The resistance of the atmosphere, and the *cause* of that resistance not increasing as the squares of the velocity, will be particularly elucidated in this treatise by careful experiment.

in 18 seconds; 71·9 in 28 seconds: and 124·6 in 38 seconds: Therefore,

In open atmosphere. In vacuo.

$$71{\cdot}9 \div 25 = 2{\cdot}876, \text{ and } \frac{12608{\cdot}072}{5210{\cdot}892} = 2{\cdot}419.$$

Again, omitting fractions,

In open air. In vacuo.

$$124 \div 71 = 1{\cdot}746, \text{ and } \frac{23224}{12608} = 1{\cdot}842.$$

Again, to make the proof more indisputable (relying upon the measurement of Mr. Wood), we find that, according to his experiments, the carriage descended, omitting fractions, 25 feet in 18 seconds, and 1266 feet in 128 seconds. Now, as before observed, a body would fall, in vacuo, in 18 seconds, about 5211 feet, because $18 \times 18 \times 16{\cdot}083$ = to the total space; and in 128 seconds it would fall 263503·872 feet.

Now $1266 \div 25$ (in air) = 50·64;
and $263503 \div 5211$ (in vacuo) = 50·56.

How very striking, then, is the proportion which the falling body bears in vacuo to the descending body, when opposed to the resistance of the air! So much so, that Mr. Wood must either have imposed upon the public, which I do not and cannot believe, or his experiments, though not intended to elucidate the theory of resistance, are a death-blow to the previously admitted opinions on this subject.

Again, referring to Mr. Wood's experiments (see page 225), we find a perfect regularity in the descending motions; for instance, the carriage was 29·16 seconds in moving 100 feet, and 58·33 in descending 400 feet.

In other instances:

Time in descending 100 feet.	Time in descending 400 feet.
29·10 seconds	58·10
30	60·41
29·16	58·75
31·95	64·35

and all with different loads, varying from 1,120 to 8,960 lbs.

Again, page 226, when the carriage was loaded with 8,960 lbs. it fell 100 feet in 29 seconds, and 400 feet in 58.

Again, in 29 seconds it fell 57·90 feet.
Again, 29·10 " " 58·40 "
Again, 29·74 " " 60·25 "
Again, 31·88 " " 63·75 "

the weights varying as before.

We will next observe whether the proportions were regular. In doing this we find (page 225) that the carriage, with a load of 1,120 lbs. fell 200 feet in 45 seconds, and 300 feet in 55 seconds. Now, in vacuo, a body would fall in

45 seconds - - - 32568·075 feet,
and in 55 seconds - - - 48651·075 feet.

Now $300 - \frac{1}{3} = 200$, the fall in 45 seconds on the inclined plane; and $48651 - \frac{1}{3} = 32434$, showing a difference of only 134 in about 32,000.

In another experiment, with 4,480 lbs., the carriage fell 400 feet in 60·41 seconds,
and 500 feet in 67·91 seconds.

Now, in vacuo, a body would fall in
60·41 seconds, 58512·7871523 feet;
and in 67·91 " 74315·8133523 "
therefore, $400 + \frac{1}{4} = 500$
$58512 + \frac{1}{4} = 73140$, showing a difference in comparative velocity not worth noticing.

Again, with 1120 lbs., in which instance, owing to the lighter weight, the resistance of the air ought to have been the most felt, we find the body descending,

In 64·35 seconds, 400 feet
72·64 " 500 "

Now $400 + \frac{1}{4} = 500$, and
$66958 + \frac{1}{4} = 83247$, showing a difference which is altogether immaterial; for had the distance traversed been 400 and 510 feet, instead of 400 and 500, the proportions *in vacuo* and in open atmosphere would have been precisely alike. Surely, then, these 10 *feet*, considering the variation of friction, by the occasional rubbing of the flanches against the rail, will be regarded as a difference altogether independent of the resistance of air!

There are many more experiments of Mr. Wood's to which I could have referred in support of my opinion. It is true there are some which show a different result; but the effect might arise from the different state of the rails at different times, and the particular point from which the wind blew. It cannot, however, be doubted, or, if doubted, denied, that the uniformity of acceleration, proved by the experiments herein detailed, *could not have occurred in any instance had the resistance of the air increased as the squares of the velocity.*

I shall, in a further communication, turn to my recent experiments on the Liverpool and Manchester railway, for the purpose of adding additional strength to this argument. Meanwhile I am, sir, with much respect, your very obedient servant, RICHARD BADNALL.

Manchester, Nov. 11, 1833.

THE NEW YORK AND PENNSYLVANIA CANALS.—According to the Pittsburg Gazette, the Pennsylvania Canal was open on the 8th inst., "and but for some repairs necessary to an aqueduct "might have been open a month earlier."

Our Canal will not be open'd 'till 17th April—although the winter has been an unusually mild one. Hence we perceive a positive difference of *forty days*—and a possible one, under ordinary circumstances, of *two months*, in favor of the route to the great West through Pennsylvania.

This is a serious consideration for us in N. York, and should turn the attention of all to the adoption of some settled policy which may enable us to counteract so great a disadvantage. The physical obstacles of climate we cannot overcome, and hence it is certain that the Pennsylvania canals will always be open to navigation *weeks* earlier than ours. But this disvantage may, we are persuaded, be more than compensated by wise policy on our part. Our first and great aim should be, so to diminish the expense of transportation on our Canals, as in that particular alone to present a powerful inducement to the trade, But how is that to be done? Manifestly by extinguishing as rapidly as possible the Canal debt; so that it being paid, there may be no motive to raise an amount of tolls greater than will suffice to keep the Canals in repair.

We have received the 5th number of a paper recently commenced at Navarino, (Wisconsin Territory,) called the Green Bay Intelligencer. It appears to have been about six weeks in travelling from Navarino to New York. The distance by land is 1100 or 1200 miles. Arrangements have been made for running steamboats regularly, the coming season, between Navarino and Detroit. During the last season, the number of arrivals was 34, viz. 5 steamboats, and 29 schooners. An emigrant recently arrived at Navarino thus writes:

The "extent of this settlement" is much more considerable than I had supposed before I came on. The houses are quite thick on each side of Fox River for six miles from its mouth. There are two small clusters of buildings, or villages, Navarino and Menomoneeville, in the first of which, being nearest the mouth of the river, the most of the business is done. In the distance of 3 miles from one village to the other, may be enumerated four wharves, seven warehouses, nine dry-good and grocery stores, besides several small shops, &c. &c. A good grist mill is in operation within one and a half miles of Navarino, and there are several saw mills in the neighborhood. Opposite to Navarino, on the west bank of Fox river, is a Garrison (Fort Howard) of 4 Companies of United States troops.

From "this place to the Wisconsin river" at the "Portage" the distance is 180 miles, following the river, and considerably less by land. Fox river is navigated by boats of 15 tons burthen all the way from here to the Portage; which is 1 1-4 miles over, and is all the land carriage between this and the Mississippi. This is a great and important thoroughfare.—There are 3 settlements on the Wisconsin, besides the one at the Portage where Fort Winnebago stands, viz. Helena, English-Prairie and Prairie des Chiens, which last is at its mouth on the Mississippi. It is 210 miles from this to Chicago, the route is considerably travelled already, and the Government is opening a road the whole distance, also one from here to the Mississippi. The latter is laid out and is to be opened by contract immediately. The other will be surveyed early in the spring.—[Journal of Commerce.]

MAGNETIC POLE.—We understand that the position of the Magnetic Pole is now finally ascertained by our adventurous countryman, Captain Ross. He has actually been on the spot where the dipping needle becomes vertical, or points straight downwards; while the horizontal needle, having, as it were, no longer any thing to point towards, remains indifferently in any direction given it.—[Athenæum.]

Captain Ross has ascertained beyond question that the Magnetic Pole is nearly in 70° N. lat., and 97° W. long., being 2° of lat., and 3° of long. different from what it was said to be by Captain Parry's observations.—[Naval and Military Gazette.]

Animal Mechanics, or Proofs of Design in the Animal Frame. [From the Library of Useful Knowledge.]

(Continued from page 135.)

Consider two men wrestling together, and then think how various the property of resistances must be: here they are pulling, and the bones are like ropes; or again, they are writhing and twisting, and the bones bear a force like the axle-tree between two wheels; or they are like a pillar under a great weight; or they are acting as a lever.

To withstand these different shocks, a bone consists of three parts, the *earth* of bone (sub-phosphate of lime); *fibres* to give it toughness; and *cartilage* to give it elasticity. These ingredients are not uniformly mixed up in all bones; but some bones are hard, from the prevalence of the earth of bone; some more fibrous, to resist a pull upon them; and some more elastic, to resist the shocks in walking, leaping, &c. But to return to the forms. Whilst the centre of the long bones is, as we have stated, cylindrical, their extremities are expanded, and assume various shapes. The expansion of the head of the bone is to give a greater, and consequently a more secure surface for the joint, and its form regulates the direction in which the joint is to move. A jockey, putting his hand on the knee of a colt, and finding it broad and flat, augurs the perfection of the full-grown horse. To admit of this enlargement and difference of form, a change in the internal structure of the bone is necessary, and the hollow of the tube is filled up with *cancelli*, or lattice-work. These *cancelli* of the bone are minute and delicate-like wires, which form lattice-work, extending in all directions through the interior of the bone, and which, were it elastic, would be like a sponge. This more uniform texture of the bone permits the outer shell to be very thin, so that whilst the centre of the long bones are cylinders, their extremities are of a uniform cancellated structure. But it is pertinent to our purpose to notice, that this minute lattice-work, or the cancelli which constitute the interior structure of bone, have still reference to the forces acting on the bone; if any one doubts this, let him make a section of the upper and lower end of the thigh bone, and let him inquire what is the meaning of the difference in the *lie* of these minute bony fibres, in the two extremities? He will find that the head of the thigh bone stands obliquely off from the shaft, and that the whole weight bears on what is termed the *inner trochanter*; and to that point, as to a buttress, all these delicate fibres converge,

or point from the head and neck of the bone, which may be rudely represented in this way.

Fig. 10.

The preceding figure exhibits the head of the thigh bone, and shows the direction of the *cancelli*, converging to the line of gravity.

We may here notice an opinion that has been entertained in regard to the size of animals. It is believed that the material of bone is not capable of supporting a creature larger than the elephant, or the *mastodon*, which is the name of an extinct animal of great size, the osseous remains of which are still found. This opinion is countenanced by observing that their bones are very clumsy, that their spines are of great thickness, and that their hollow cylinders are almost filled up with bone.

It may be illustrated in this manner: A soft stone projecting from a wall may make a stile, strong enough to bear a person's weight; but if it were necessary to double its length, the thickness must be more than doubled, or a free-stone substituted; and were it necessary to make this free-stone project twice as far from the wall, even if doubled in thickness, it would not be strong enough to bear a proportioned increase of weight: granite must be placed in its stead; and even the granite would not be capable of sustaining four times the weight which the soft stone bore in the first instance. In the same way the stones which form an arch of a large span must be of the hardest granite, or their own weight would crush them. The same principle is applicable to the bones of animals. The material of bone is too soft to admit an indefinite increase of weight; and it is another illustration of what was before stated, that there is a relation established through all nature, and that the very animals which move upon the surface of the earth are proportioned *to its magnitude*, and the gravitation to its centre. Archdeacon Paley has with great propriety taken the instance of the form of the ends of bones, as proving design in the mechanism of a joint. But there is something so highly interesting in the conformation of the whole skeleton of an animal, and the adaptation of any one part to all the other parts, that we must not let our readers remain ignorant of the facts, or of the important conclusions drawn from them.

What we have to state has been the result of the studies of many naturalists; but although they have labored, as it were, in their own department of comparative anatomy, they have failed to seize upon it with the privilege of genius, and to handle it in the masterly manner of Cuvier.

Suppose a man ignorant of anatomy to pick up a bone in an unexplored country, he learns nothing except that some animals have lived and died there; but the anatomist can, by that single bone, estimate not merely the size of the animal, as well as if he saw the print of its foot, but the form and joints of the skeleton, the structure of its jaws and teeth, the nature of its food, and its internal economy. This, to one ignorant of the subject, must appear wonderful, but it is after this manner that the anatomist proceeds. Let us suppose that he has taken up that portion of bone in the limb of the quadruped which corresponds to the human wrist; and that he finds that the form of the bone does not admit of free motion in various directions, like the paw of the carnivorous creature. It is obvious by the structure of the part, that the limb must have been merely for supporting the animal, and for progression, and not for seizing prey. This leads him to the fact that there were no bones resembling those of the hand and fingers, or those of the claws of the tiger; for the motions which that conformation of bones permits in the paw would be useless without the rotation of the wrist—he concludes that these bones were formed in one mass, like the cannon bone, pastern-bone, and coffin-bones of the horse's foot.*

The motion limited to flexion and extension of the foot of a hoofed animal implies the absence of a collar bone and a restrained motion in the shoulder joint; and thus the naturalist, from the specimen in his hand, has got a perfect notion of all the bones of the anterior extremity! The motions of the extremities imply a condition of the spine which unites them. Each bone of the spine will have that form which permits the bounding of the stag, or the galloping of the horse, but it will not have that form of joining which admits the turning or writhing of the spine, as in the leopard or the tiger.

And now he comes to the head: the teeth of a carnivorous animal, he says, would be useless to rend prey unless there were claws to hold it, and a mobility of the extremities like the hand to grasp it. He considers, therefore, that the teeth must have been for bruising herbs, and the back teeth for grinding. The socketing of these teeth in the jaw gives a peculiar form to these bones, and the muscles which move them are also peculiar; in short, he forms a conception of the shape of the skull. From this point he may set out anew, for by the form of the teeth he ascertains the nature of the stomach, the length of the intestines, and all the peculiarities which mark a vegetable feeder.

Thus the whole parts of the animal system are so connected with one another, that from one single bone or fragment of bone, be it of the jaw, or of the spine, or of the extremity, a really accurate conception of the shape, motions, and habits of the animal may be formed.

It will readily be understood that the same process of reasoning will ascertain, from a small portion of a skeleton, the existence of a carnivorous animal, or of a fowl or of a bat, or of a lizard, or of a fish; and what a conviction is here brought home to us, of the extent of that plan which adapts the members of every creature to its proper office, and yet exhibits a system extending through the whole range of animated beings, whose motions are conducted by the operation of muscles and bones.

* For these are solid bones, where it is difficult to recognize any resemblance to the carpus, metacarpus, and bones of the fingers; and yet comparative anatomy proves that these moveable bones are of the same class with those in the solid hoof of the *bellua* of Linnæus.

After all, this is but a part of the wonders disclosed through the knowledge of a thing so despised as a fragment of bone. It carries us into another science; since the knowledge of the skeleton not only teaches us the classification of creatures now alive, but affords proofs of the former existence of animated beings which are not now to be found on the surface of the earth. We are thus led to an unexpected conclusion from such premises: not merely the existence of an individual animal, or race of animals, but even the changes which the globe itself has undergone in times before all existing records, and before the creation of human beings to inhabit the earth, are opened to our contemplation.

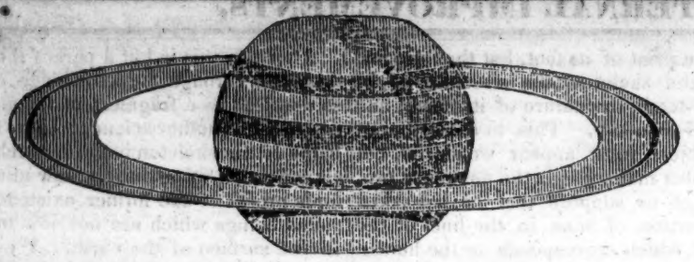
Of Standing.—This may appear to some a very simple inquiry, and yet it is very ignorant to suppose it is so. The subject has been introduced in this fashion: "Observe these men engaged in raising a statue to its pedestal with the contrivances of pullies and levers, and how they have placed it on the pedestal and are soldering it to keep it steady, lest the wind should blow it down. This statue has the fair and perfect proportions of the human body; to all outward appearance it ought to stand."

In the following passage we have the same idea thrown out, in a manner which we are apt to call *French*. Were a man cast on a desert shore, and there to find a beautiful statue of marble, he would naturally exclaim, "Without doubt there have been inhabitants here: I recognize the hand of a famous sculptor: I admire the delicacy with which he has proportioned all the members of the body, to give them beauty, grace, and majesty, to indicate the motion and expression of life." But it may be asked, what would such a man think if his companion were to say, "Not at all; no sculptor made this statue; it is formed, to be sure, in the best taste, and according to the rules of art, but it is formed by chance. Amongst the many fragments of marble there has been one thus formed of itself. The rain and the winds have detached it from the mountain, and a storm has placed it upright on the pedestal. The pedestal, too, was prepared of itself in this lonely place. True, it is like the Apollo, or the Venus, or the Hercules. You might believe that the figure lived and thought; that it was prepared to move and speak; but it owes nothing to art—blind chance has placed it there."*

The first passage suggests the conviction, that the power of standing proceeds not from any symmetry, as in a pillar, or from gravitation alone. It, in fact, proceeds from an internal provision, by which a man is capable of estimating with great precision the inclination of his body, and correcting the bias by the adjustment of the muscles. In the second passage, it is meant to be shown that the outward proportion of the form bears a relation to the internal structure; that grace and expression are not superficial qualities, and that only the Divine Architect could form such a combination of animated machinery.

We shall consider how the human body is prepared by mechanical contrivances to stand upright, and by what fine sense of the gravitation of the body the muscles are excited to stiffen the otherwise loose joints, and to poise the body on its base.

* Demonstration de l'Existence de Dieu, par Fenelon.



Of Saturn.—The planet Saturn is 79,491 miles in diameter, and performs his revolution round the sun in 10,746 days, 19 hours, 16 minutes, at the distance of 903,690,197 English miles. His motion in his orbit is said to be 18,000 miles per hour; and the time he revolves on his axis 10 h. 16′ by some astronomers, and by others only 6 hours.

Saturn is distinguished from all the other planets by a large luminous ring surrounding his body, which was discovered by the celebrated Huygens, about the end of the 17th century. The same astronomer also discovered the fourth satellite, which attends this planet, and on that account is sometimes called the Huygenian satellite. The ring which surrounds Saturn appears double when seen through a good telescope, and is seen to cast a deep shadow on the planet. Dr. Herschel is of opinion that the ring has a motion round its axis; but this is doubted by Schroeter, and some other astronomers. Respecting the formation of this strange phenomenon, astronomers have been very different in their opinions, but the difficulty still remains as formidable as ever.

The annexed figure represents this planet as seen by Sir William Herschel, on various occasions, with his powerful telescope.

To Saturn the sun appears only one-ninetieth part of the size it does to the earth; and the light and heat which that planet receives from the sun are in the same proportion. But to compensate for the scantiness of light derived from the sun, Saturn has been observed to have no fewer than seven satellites revolving round him, besides the luminous ring that surrounds his body. The Huygenian, or fourth satellite, was the first discovered; the first, second, third, and fifth, were some years afterwards discovered by Cassini; and the sixth and seventh were discovered by Dr. Herschel, in the year 1789. These satellites are all so small, and at such a distance from the earth, that they cannot be seen, unless with very powerful telescopes.

The orbit of the planet Saturn was long considered as the boundary of the solar system, except the cometary orbits, which were always believed to stretch far beyond it. But by the discovery of the planet Georgium Sidus, this system has been extended far beyond the limits formerly assigned it.

Of Georgium Sidus.—A new planet was discovered by Dr. Herschel, on the 13th of March, 1781, and called by him Georgium Sidus, out of respect to his Majesty George III., but astronomers have given it the names of Herschel and Uranus. This planet is situated far beyond the orbit of Saturn, being at the immense distance of 1,822,568,000 miles from the sun. The time it requires to perform its revolution round that luminary is 83 years, 150 days, 18 hours. Its diameter is about 4¼ times greater than hat of the earth, or nearly 35,000 English miles. The distance of this planet from the sun being about double that of Saturn, can scarcely be discovered by the naked eye. However, when the sky is very clear, it may be perceived by a good eye, like a faint star of the fifth magnitude; but it cannot be readily distinguished from a fixed star with a telescope of a less magnifying power than 200. This planet is placed at so great a distance from the sun that it can receive but a very small portion of his light; however, this want is in some measure supplied by six satellites that revolve round it, all of which were discovered by Dr. Herschel. The periodic times of these satellites are as follows: The first is 5d. 21h. 25′; the second, 8d. 7h. 1′ 19″; the third, 10d. 23h. 4′; the fourth, 13d. 11h. 5′; the fifth, 38d. 1h. 49′; and the sixth, 107d. 16h. 40′. It is a remarkable circumstance that all these satellites move round the planet in a retrograde order, and that their orbits are nearly all in the same plane, almost perpendicular to the ecliptic.

New Ink Distributor.—We were lately shown, by Warren Jenkins, of this town, a new or improved machine, invented by himself, for regulating, with mathematical exactness, the distribution and application of ink to the types. This machine is the first attempt of the kind by the inventor, and, therefore, imperfect in some of its mechanical details; but, in its present condition, it answers the intended purpose very well. We have scarcely a doubt that the principle upon which the machine is constructed is correct, and that a more perfect mechanical construction of all its parts will make it fully to answer the purposes for which it is designed.

Should our anticipations be realized, and there seems little room to doubt that they will, an ordinary pressman, with the assistance of a boy capable of moving the *rollers*, can take any number of *clear, uniform* impressions, extending throughout a whole *form* or a whole book. This machine will, therefore, be no less important to readers who desire beauty and uniformity in what they read, than to printers who are responsible for the quality of their work.

When the machine is once regulated so as to take a suitable quantity of ink, which will be the labor of but a few minutes, the pressman is relieved from further care in relation to the uniformity of the impressions, as the application of the ink to the rollers is entirely beyond the control of the boy who does the rolling. We may also add, that the machine is of simple construction, and of course, little liable to get out of order; whilst the cost will probably place it within the reach of every person owning a press. Several other advantages might be enumerated, but we think enough has been said to entitle it to the consideration of printers.—[Cincinnati Journal of Science.]

Statistics of Brewing in England and Scotland.—There were 216 brewers in Scotland last year, of which above 33 are in the Edinburgh collection. Argyll has only one. There are 17,070 licensed victuallers in Scotland, which is 1 for every 123 persons, young and old, in the country; and though grocers who sell beer are evidently included with innkeepers, the proportion is still very great. England, which is a *thirsty* country, rejoices in 50,800 victuallers, and 30,000 "persons licensed for the general sale of beer," making an aggregate of 81,700 retailers of beer, which is 1 for every 170 souls. England has 1753 brewers, of whom 108 are in London. Of the retailers of beer, 37,000, or nearly one-half, brew their own beer. In Scotland, only 318 out of 17,070, or 1 in 57, brew their own beer. In Scotland, 990,000 bushels of malt were used for brewing in all the 16 collections, of which one-tenth was used by the licensed victuallers; 432,000 bushels were used in the Edinburgh collection; 62 bushels served the two collections of North and South Argyll, containing 100,000 souls. In England, 25,800,000 bushels of malt were consumed in the manufacture of beer: 13,800,000 by the brewers, and 12,000,000 by the victuallers or other retailers. In Scotland, the malt brewed is at the rate of four-tenths of a bushel for each person; in England it is 1¾ bushel. Ireland consumed 1,540,000 bushels of malt in her breweries, which is about two-tenths of a bushel for each person. Of brewed liquor, *one* Englishman drinks as much as *four* Scotchmen, or *nine* Irishmen. In 1831, there were 928,000 bushels of malt used for brewing in Scotland, of which 834,000 were used by the brewers, the rest by victuallers. In 1830, the Scotch brewers consumed 740,000, but the paper from which this is taken does not mention the victuallers. The increase in the quantity of malt used by the brewers since 1830 seems to be about *one-fifth*.

AGRICULTURE, &c.

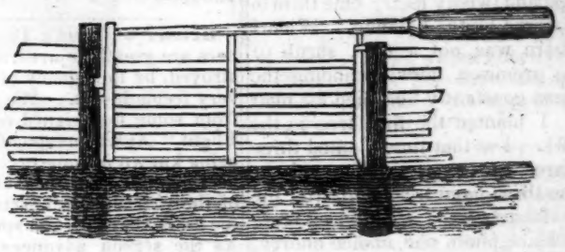
Early sown Vegetables inferior in Quality and Quantity to those sown later. By H. H.

[For the Quarterly Journal of Agriculture, Mechanics, and Manufactures.]

Mr. Editor,—The season is now approaching us rapidly when we shall be served with a variety of means and methods for procuring *early* culinary productions for the table. I do not know but there is room for improvement in this respect—doubtless, there is with many; but you will permit me to say that I have not a profound regard for a *forced* growth with any article in the vegetable kingdom. My reasons for viewing the subject in this light I will give. 1st. Because persons in general cannot make the necessary preparations, and bestow the extra care and service required to secure those early productions, and find themselves remunerated by the article. Persons who cultivate grounds with a view to supply a market may find themselves compensated for their labor in the sale of those early productions, and gentlemen of fortune can gratify their cravings for those premature productions a few days earlier than their neighbors, by applying time and money to that object; but this will not prove that the generality of your readers can adopt this course without a loss of time and money. 2. As far as my own experience is concerned, those *forced* productions are inferior in point of flavor to those which come in their season, and are often of a sickly quality. They are generally thrown into the market in an unripe state, when they possess scarcely any of the qualities which they obtain in their maturity; and the consequence is, sickness is prevalent in our cities. I recollect to have seen, within a few years past, a remonstrance from the Board of Health in Boston, or from the most eminent physicians of that city, against the practice I am now speaking of, and particular objection was made to the *forced growth* of the cucumber, and its early sale in

market. This accorded so far with my own limited observation in the country, that I could not but consider it entitled to special consideration. 3. I am well satisfied, by my own observation, that more persons in the country deprive themselves of the luxuries of a good garden every year, by sowing too early, than they do by sowing too late, or not sowing at all. There is one remark almost universal every year with those whose gardens I have inspected during the season —"I sowed my seeds early, and they came up and looked thrifty for a while, but there came on a cold, wet spell of weather, which, with the aid of insects, destroyed them, about every one." There is, however, a remedy for this in almost every instance, in resowing after the destruction of the first sowing, if persons did not generally think that it would avail nothing to resow so late in the season. I have been in the practice, for a number of years, of noting down the month and the day in each year when I committed my different kinds of seeds to the soil, and this I have done on the bottom lands in the Connecticut valley, and on the high lands of New-England, and I find this note appended to my journal for June 15th, 1832,—"I am now fully convinced, that, with the exception of onions, peas, pepper-grass, lettuce, English turnips, and a few potatoes for early use, all kinds of horticultural produce, which are generally cultivated in New-England, will succeed best, nine times in ten, by not sowing until the last week in May." On the 27th of May, 1830, I planted my cucumbers, and they yielded abundantly. May 21, 1831, I planted cucumbers; on the 23d, I planted some more and on the 1st of June planted again. Those planted on the 21st of May failed, and those planted on the 1st June did better than those on the 23d of May. On the 18th of May, 1832, I planted cucumbers, and on the 2d of June I planted some more, and on the 4th of June I replanted where I sowed on the 18th of May, the first planting having failed; the last succeeded well. On the 31st of May of this same year, I replanted early bush beans, where I had planted on the 18th of this month with a failure. And on the 20th of June, I resowed the parsnip-bed, which was first sowed on the 8th of May; and from this last sowing I realized a good crop of parsnips. On the 23d of May sowed carrots, beets, peppers, cabbages, radishes, English turnips, and planted my cucumbers. All succeeded well, whilst most of my neighbors who sowed earlier were cut short in quality and in quantity. I will state in this connection that, in two instances, I have raised the finest onions I have ever raised from sowings in the first week in June, but they will ordinarily succeed better from early sowing. And now, if we will allow for difference of soil, and something for local situation, I will venture to have my position put to the test by the people of New-England, and by all others at the west of us, upon the same degrees of latitude, that, nine times in ten, what is considered *late* sowing will succeed best, with the exceptions I have made. One special reason is, as I conceive, vegetation never progresses rapidly until the soil and atmosphere attain to a certain degree of temperature, and it succeeds best when this is uniform. Cool nights are prejudicial to plants of all descriptions, so far as my experience extends; and to many they are almost fatal: they are so to the cucumber. A warm sun and a bland atmosphere during the day will put the juices of the plant into circulation, and open the pores; but if the succeeding night is cool, those juices stagnate, the pores close, and the progress of vegetation is suspended, and if this is acted over for many nights in succession, the stock of the plant assumes a sticky hardness, the pores are fast closed, and the channels for the sap to circulate in are contracted so as greatly to impede the progress of the fluids during the day; and although the plant survives the shock, yet it is a sickly plant, its leaves and tendrils are dwarfish and dry, and its fruit is scanty, bitter, and crooked, and indented with dark spots; whereas, the plant that comes into existence later in the season, when the earth is warm and the nights are bland, continues its growth through the twenty-four hours, has a fresh and lively appearance, overtakes and passes by its kindred vine, that has been long struggling with adversity; its fruit is straight, juicy, and abundant. Another reason why many of those early sown plants fail, is, because those small insects, called black lice, or fleas, prevail most during the cold season in May, and they draw from the plant the little life it derives from the earth, and it yields its life to an ignoble enemy! I would say, then, to my New-England friends especially, be not over anxious to commit your garden seeds to the soil, because you experience a few warm days in the beginning or in the middle of May, except those kinds of plants which experience has shown are the least affected by the cold and wet, and which require the longest season to reach maturity. You may be certain of a cold fortnight between you and summer, during which time, your seeds had better be out of the ground than in; but this you *may* do, and *ought* to do,—improve your *kind* of plants, have your ground well prepared for receiving the seed, and embrace the first sure indications of approaching summer to commit your seeds to the earth and to a beneficent Providence.

Respectfully yours, H. H.



Balance Gate. By D. Lapham. [From the Farmers' Reporter.]

Sir,—If the following improvement in the construction of farm gates should be deemed of sufficient value to be of use to the farmers of this country, you are requested to make it known to them through the medium of your valuable paper.

This gate consists of two main posts, set firmly in the ground at the proper distance asunder, in the line of the fence; that part which is above the ground is made about 12 inches square, and the lower part is left round, forming a shoulder at the surface of the ground. These posts have mortices on the exterior sides to receive the rails of the fence. The gate itself is formed of three posts of scantling, 4 by 5 inches square, into which are framed about six strips of 1¼ inch boards, 4 inches wide, so as to form a rectangular gate of the length and height required. Upon the top of these posts rests a beam, which extends back far enough just to balance the gate. The heel-post, upon which the gate turns, rests upon the shoulder of the main post, at the surface of the ground, where there is a depression made to receive it, and it is secured at the top by a staple, or hoop of iron, passing around it, (the upper part of the post being rounded for that purpose,) and is fastened into the main post. The latch or fastening is formed by making one of the slats pass through the front post in a long mortice; and the slat being cut in two at the middle post, and secured by a pin, the piece can be raised or lowered in such a manner as to latch and unlatch the gate. The notch is cut out of the main post, to receive the latch in such a manner as to allow the gate to open either way. This gate is much neater, more substantial, and is less liable to get out of repair, than those formerly in use. There are two gates of this description on the farm where my father resides, in the north part of Champaign county, and he intends soon to have one to each of his fields. D. Lapham.

Cincinnati, Ohio, Dec. 19, 1833.

Straw Cutting Machine.—A few weeks ago, we purchased for a subscriber on the eastern shore of Maryland, one of Sinclair & Moore's straw cutters, of the middle size. We this week received from him the following testimony of its excellence, which we publish rather for the benefit of the public, than for that of the worthy manufacturers. By the way, it seems to be universally allowed by all who have tried it, that the saving by the cutting of *all long food* for stock is a very important one. We have noticed the testimony of farmers, of graziers, of dairy-men, and of stage proprietors, all to the same point, and have never heard one state a contrary opinion against it. Those who have tried steaming this cut food, seem to agree pretty unanimously that this operation improves its quality still as much more. Surely these facts are worthy the careful attention of all concerned in the feeding of cattle and horses—but here is an extract from our friend's letter:

"I am delighted with my straw cutter. It will have saved all the money it cost before May-day. The 'meat, drink, washing and lodging,' of *each* of my carriage horses, cost me the last year at least $100: by means of the straw-cutter, I can give them better board, keep them sleeker and happier; and (at the present price of produce) *both* of them, the current year, will not cost me more than $60. I shall be the means of procuring a market for several straw-cutters, at which I rejoice, not on account of the seller, but the buyer.—[Amer. Farmer.]

Extract of Sumac.—This substance is prepared in Sicily, and is used for dying and tanning skins. It occupies the one-hundredth part of the volume of common sumac. It is dissolved in tepid water.

THE VINE.—Mr. Sidney Weller says, in the American Farmer, that vines, when young, should have the ground kept loose about them, and free from weeds—that they will no more bear neglect in these particulars than corn or other hoed crops.

BLOODY MURRAIN.—A farmer in Madison county, Ohio, had lost several of his finest cattle by this disease, and upon opening them he found leeches in their stomachs, much swollen by the blood they had extracted, and it was also found that leeches were living in the water at which the cattle were in the habit of drinking. Believing that this was the cause of the disease he changed the water, and in future only gave them that which was pure; and for three years his stock had not been troubled with that disease. Although this seems to show very conclusively that leeches are the cause of the disease, yet it requires further investigation before the question can be entirely settled.—[Gen. Far.]

HOW TO MAKE THE MOST OF A LITTLE LAND.—In the spring of 1830, I purchased in this city a house and lot; the lot was fifty by one hundred and twenty feet. One third of the lot was covered by the building. When I purchased, there was not a tree, shrub or plant, on the premises, notwithstanding the house had been constantly occupied for near forty years. I planted the first tree in the spring of 1831. I at that time planted three peach and three gage trees. One of the peach and the three gage trees bore fruit the past season. I have since added three more peach, four choice plum, one choice cherry, one quince, and four choice pear trees, which bid fair to bear fruit soon. I have also three fine grape vines, that will probably bear plentifully next season, judging from their size. I have also about a dozen smaller vines. I raised on the same ground the past season, cucumbers, beets, sallads, citron melons, and nasturtiums, in great abundance for family use and for pickling. I also had a great abundance of cabbage, both for summer and winter use. In addition to the above, I have at least fifty flowering shrubs and bushes, such as roses, syringoes, altheas, lilacs, snowballs, rose acacias, flowering almonds, cape jasmines, &c. &c., with a plenty of the honeysuckle. I have at least two thousand bulbous roots, such as hyacinths, tulips, crocuses, narcissus, &c., with equal that number of annual and biennial plants and flowers, and all of the aforementioned luxuries and necessaries are enjoyed from the spot of ground that has laid waste for so great a length of time. There is still another item of profit to be added to the foregoing list: nine-tenths of the labor of cultivation has been performed with my own hands, morning and evening, when not engaged in my own regular business, unquestionably affording me a greater degree of health, and certainly a far greater degree of pleasure, than I should otherwise have enjoyed. I have also a lot in the rear of the above-mentioned, twenty-five by one hundred and twenty feet, on which there is a barn, cow-shed, and pig-stye, covering forty by twenty-five feet, leaving eighty by twenty-five feet for cultivation. Around this I have a border of two feet wide, one fourth of which is occupied by currant bushes, one fourth by raspberry, one fourth as an asparagus bed, and one fourth for spinnage, for a cabbage plant bed, for early lettuce, &c. The centre is laid out in three squares of seventeen by twenty-three feet. The first square I plant with early potatoes, the second with Lima beans, and the third with sweet corn; of the two latter, I have a great supply for my family, and some for my neighbors. Potatoes we have of the finest kind, and in great abundance through the summer season. Last fall we put about four bushels in the cellar from the same patch. We were in the summer nine in family, in the winter eight. The edge of my border I planted with bush beans; and I do not recollect that I paid a single cent for vegetables, except for the articles of green peas, and a few carrots and parsnips, the latter two of which I did not have of my own in consequence of sowing bad seed. I give you the above statement of facts, with the hope that if you should think them worth publishing, some one person may be induced to try the experiment, when he will learn that it will not only afford him a source of profit, but one of great pleasure, to grow his own vegetables; and that, while by beautifying his yard, he is not only adding to his health and comforts, but, in most cases, adding very much to the value of his property.—M. Hudson, Feb, 7, 1834.—[Gen. Far.]

BLIGHT ON APPLE TREES.—Our apple trees here are greatly injured, and some annually destroyed, by the agency of what seems to be a very feeble insect. We call it, from habit or from some unassigned cause, "the American Blight," *Aphis lanata;* this noxious creature being known in some orchards by the more significant name of "white blight." In the spring of the year a slight hoariness is observed upon the branches of certain species of our orchards. As the season advances this hoariness increases, it becomes cottony, and toward the middle or end of summer, the under sides of some of the branches are invested with a thick downy substance, so long as at times to be sensibly agitated by the air. Upon examining this substance we find that it conceals a multitude of small wingless creatures, which are busily employed in preying upon the limb of the tree beneath. This they are well enabled to do, by means of a beak terminating in a fine bristle: this being insinuated through the bark, and the sappy part of the wood, enables the creature to extract, as with a syringe, the sweet vital liquor that circulates in the plant. This terminating bristle is not observed in every individual: in those that possess it, it is of different lengths: and is usually, when not in use, so closely concealed under the breast of the animal as to be invisible. The alburnum or sap wood being thus wounded, rises up in excrescences and nodes all over the branch, and deforms it; the limb deprived of its nutriment, grows sickly: the leaves turn yellow, and the part perishes. Branch after branch is thus assailed until they all become leafless, *and the tree dies.*

This insect is vivaparous, or produces its young alive, forming a cradle for them by discharging from the extremities of its body a quantity of long cottony matter, which becoming interwoven and entangled, prevents the young from falling to the earth, and completely envelopes the parent and offspring. This languinous vestiture seems to serve likewise as a vehicle for dispersing the animal. The winds wafting about small tufts of this downy matter, convey the creature with it from tree to tree throughout the whole orchard. In the autumn, when this substance is generally long, the winds and rains of the season effectually disperse these insects, and we observe them endeavoring to secrete themselves in the crannies of any neighboring substance.

The first visit of this aphis to us is by no means clear. The epithet of American blight may be correctly applied; but we have no sufficient authority to conclude that we derived this pest from that country. Normandy, and the Netherlands too, have each been supposed to have conferred this evil upon us; but it bids fair to destroy, in progression, most of the oldest and long esteemed fruit from our orchards. —I have very successfully removed this blight from young trees, and from recently attacked places in those more advanced, by an easy application: Melt three ounces of rosin in an earthen pipkin, take it from the fire, and pour into it three ounces of fish oil; the ingredients perfectly unite, and when cold acquire the consistence of honey. A slight degree of heat will liquify it; and in this state paint over every node or infected part in the tree, using a common painter's brush. This I prefer doing in the spring, or as soon as the hoariness appears. The substance soon hardens and forms a varnish, which prevents any escape, and stifles the individuals.—[Journal of a Naturalist.]

EARLY CORN.—There are three varieties of corn that every farmer should plant, expressly for using green, without reference to it as a field crop. There are but few people in this country but are fond of boiled green corn; and by a little extra pains the season for using it may be lengthened three or four weeks; that is, it may be procured one month earlier than it generally is by the common field culture.

The varieties which we would recommend are the *Golden Soix, Flour Corn, or York Cheat,* and the *Sweet Corn.*

Golden Soix is the earliest corn with which we are acquainted; the ear is small but well shaped, and the corn is well flavored.

Flour Corn, or *York Cheat,* is a white soft corn, which comes in soon after the former; the ears are of good size, and it does not become hard and flinty, like common corn, on which account it continues longer fit for use. This will last until the sweet corn is fit for use. This corn was named York Cheat, because it was said to have been ground with wheat, in the early settlements of this country, when it could not be detected by the color of the flour. When broken, the inside of the kernel is white and mealy.

Sweet Corn.—This is undoubtedly superior to all other varieties for boiling; is very sweet, and unlike other varieties; it remains soft until it hardens by drying, when it becomes much shrivelled.

Either, or all of these varieties, may be planted in hot beds, or in light boxes of earth, which may be kept in warm situations about a house, until the fore part of May, when the plants may be taken out of the beds or box, and planted in hills in open ground, putting plenty of manure under the hill, and setting the plants pretty deep in the soil, so that if the tops should be killed by late frosts, the roots would not be injured.—[Goodsell's Genesee Farmer.]

ROLLING GRAIN.—We have on several occasions presented to our readers the results of using the roller. We now give another extract—from the Genesee Farmer.

On a careful examination of my wheat fields, the doubts I have felt and expressed in a former communication, of the propriety of rolling wheat in autumn, are now entirely removed. Where the roller had passed no cavities were left, and the surface was rendered so compact and smooth, that the water passed off. But where the roller was not used, many of the cavities have been several times, and no doubt will again be, partly filled with ice, which must unavoidably, by its expansion, destroy many plants by breaking their roots.

The season is so far advanced that we cannot expect, even should there be considerable more snow, that it will remain long on the ground; of course, wheat will be exposed to alternate freezing and thawing. This is out of the power of the farmer to prevent, but he may mitigate its effect by the use of the roller in the spring, as soon as the ground is dry to the depth of three or four inches. This operation will not only press down that which has been raised by the frost, but by pulverizing the surface, cause the wheat to spread, and if grass seed has been sown, the beneficial effect on that will be great.

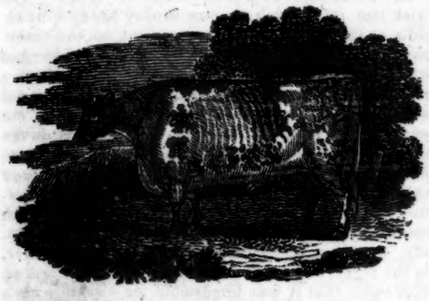
I have therefore come to the conclusion, that *the wheat crop is benefitted by the roller both in autumn and spring.*

Neat Cattle of Great Britain.—We give descriptions of the principal breeds of British cattle:

The *long-horned or Lancashire breed of cattle* is distinguished from others by the length

of their horns, the thickness and firm texture of their hides, the length and closeness of their hair, the large size of their hoofs, and coarse, leathery, thick necks; they are likewise deeper in their fore quarters, and lighter in their hind quarters, than most other breeds; narrower in their shape, less in point of weight than the short horns, though better weighers in proportion to their size; and though they give considerably less milk, it is said to afford more cream in proportion to its quantity. They are more varied in their color than any of the other breeds; but, whatever the color be, they have in general a white streak along their back, which the breeders term finched, and mostly a white spot on the inside of the hough. In a general view, this race, notwithstanding the singular efforts that have been made towards its improvement, remains with little alteration; for, excepting in Leicestershire, none of the subvarieties (which differ a little in almost every one of those counties where the long horns prevail) have undergone any radical change or any obvious improvement.

The improved breed of Leicestershire is said to have been formed by Webster, of Cauley,

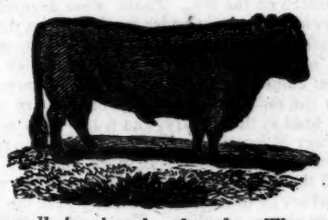


near Coventry, in Warwickshire, by means of six cows brought from the banks of the Trent, about the beginning of the present century, which were crossed with bulls from Westmoreland and Lancashire. Bakewell, of Dishley, in Leicestershire, afterwards got the lead as a breeder, by selecting from the Cauley stock; and the stocks of several other eminent breeders have been traced to the same source.

The short-horned, sometimes called the Dutch breed, is known by a variety of names,

taken from the districts where they form the principal cattle stock, or where most attention has been paid to their improvement; thus, different families of this race are distinguished by the names of the *Holderness*, the *Teeswater*, the *Yorkshire*, *Durham*, *Northumberland*, and other breeds. The Teeswater breed, a variety of short horns, established on the banks of the Tees, at the head of the vale of York, is at present in the highest estimation, and is alleged to be the true Yorkshire short-horned breed. Bulls and cows from this stock, purchased at most extraordinary prices, are spread over all the north of England, and the border counties of Scotland. The bone, head, and neck of these cattle are fine; the hide is very thin; the chine full; the loin broad; and the carcase throughout large and well-fashioned; and the flesh and fatting quality equal, or perhaps superior, to those of any other large breed. The short-horns give a greater quantity of milk than any other cattle: a cow usually yielding twenty-four quarts of milk per day, making three firkins of butter during the grass season: their colors are much varied, but they are generally red and white mixed, or what the breeders call flecked. The heaviest and largest oxen of the short-horned breed, when properly fed, victual the East India ships, as they produce the thickest beef, which, by retaining its juices, is the best adapted for such long voyages.

The Devonshire cattle are of a high red color, (if any white spots, they reckon the breed impure, particularly if those spots run one into another), with a light dun ring round the eye, and the muzzle of the same color, fine in the bone, clean in the neck, horns of a medium length, bent upwards, thin-faced, and fine in the chops, wide in the hips, a tolerable barrel, but rather flat on the sides, tail small, and set on very high; they are thin skinned, and silky in handling, feed at an early age, or arrive at maturity sooner than most other breeds. Another auther observes, that they are a model for all persons who breed oxen for the yoke. The weight of the cows is usually from thirty to forty stone, and of the oxen from forty to sixty; the North Devon variety, in particular, from the fineness in the grain of the meat, is held in high estimation in Smithfield.



The polled or hornless breeds.—The most numerous and esteemed variety is the Galloway breed, so called from the province of that name, in the south-west of Scotland, where they most abound. The true Galloway bullock "is straight and broad on the back, and nearly level from the head to the rump, broad at the loins, not, however, with hooked bones, or projecting knobs, so that, when viewed from above, the whole body appears beautifully rounded; he is long in the quarters, but not broad in the twist; he is deep in the chest, short in the leg, and moderately fine in the bone; clean in the chop and in the neck; his head is of a moderate size, with large rough ears, and full, but not prominent eyes, or heavy eyebrows, so that he has a calm though determined look; his well-proportioned form is clothed with a loose and mellow skin, adorned with long soft glossy hair." The prevailing color is black or dark-brindled, and, though they are occasionally found of every color, the dark colors are uniformly preferred, from a belief that they are connected with superior hardiness of constitution. The Galloways are rather undersized, not very different from the size of the Devons, but as much less than the long horns as the long horns are less than the short horns. On the best farms the average weight of bullocks three and a half years old, when the greater part of them are driven to the south, has been stated at about forty stone, *avoirdupois*; some of them, fattened in England, have been brought to nearly one hundred stone.

Lime and Animal Manure for Wheat.—Lime has been found by chemical analysis to compose a very considerable portion of the kernel of wheat. It has also been found that any considerable quantity of animal manure, applied to land where wheat is sown, has a tendency to cause it to grow rapid, and of course the sap bursts out, and it rots, as we call it; and when this takes place the kernel becomes shrivelled, and is rendered nearly useless; and no human means can prevent it, if we enrich our land largely with animal manure. A previous clover crop ploughed in is enough to cause wheat to grow sufficiently large, unless we wish for straw instead of kernel. This cannot always conveniently be had when we wish to sow wheat. In such case it is desirable to place something on the soil which will cause it to grow, and not surfeit it. We learn that in Great Britain, nothing has succeeded so well as lime. The farmers there, within fifteen years, have by the proper use of lime been able to procure 30 or 40 per cent. more of the golden crop than formerly.—[Maine Farmer.]

Attack of Wild Elephants on a Granary.—A small body of seapoys stationed at an outpost to protect a granary, containing a large quantity of rice, was suddenly removed, in order to quiet some unruly villagers, a few miles distant, who had set the authorities at defiance. Two of our party happened to be on the spot at the moment. No sooner had the seapoys withdrawn, than a herd of wild elephants, which had long been noticed in the neighborhood, made their appearance in front of the granary. They had been preceded by a scout, which returned to the herd, and having no doubt satisfied them, in a language which to them needed no interpreter, that the coast was clear, they advanced at a brisk pace towards the building. When they arrived within a few yards of it, quite in martial order, they made a sudden stand, and began deliberately to reconnoitre the object of their attack. Nothing could be more wary and methodical than their proceedings. The walls of the granary were of solid brick work, very thick, and the only opening into the building was in the centre of the terraced roof, to which the ascent was by a ladder. On the approach of the elephants, the two astonished spectators clambered up into a lofty banyan tree, in order to escape mischief. The conduct of the four-footed besiegers was such as strongly to excite their curiosity, and they therefore watched their proceedings with intense anxiety. The two spectators were so completely screened by the foliage of the tree to which they had resorted for safety, that they could not be perceived by the elephants, though they could see very well, through the little vistas formed by the separated branches, what was going on below. Had there been a door in the granary, all difficulty in obtaining an entrance would have vanished; but four thick brick walls were obstacles which seemed at once to defy both the strength and sagacity of these dumb robbers. Nothing daunted by the magnitude of the difficulty which they had to surmount, they successively began their operations at the angles of the building. A large male elephant, with tusks of immense proportions, labored for some time to make an impression, but after a while his strength was exhausted and he retired. The next in size and strength then advanced, and exhausted his exertions with no better success. A third then came forward,

and applying those tremendous levers with which his jaws were armed, and which he wielded with such prodigious might, he at length succeeded in dislodging a brick. An opening once made, other elephants advanced, when an entrance was soon obtained sufficiently large to admit the determined marauders. As the whole herd could not be accommodated at once, they divided into small bodies of three or four. One of these entered, and when they had taken their fill they retired, and their places were immediately supplied by the next in waiting, until the whole herd, upwards of twenty in number, had made a full meal. By this time a shrill sound was heard from one of the elephants, which was readily understood, when those that were still in the building immediately rushed out and joined their companions. One of the first division, after retiring from the granary, had acted as sentinel while the rest were enjoying the fruits of their sagacity and perseverance. He had so stationed himself as to be enabled to observe the advance of an enemy from any quarter, and upon perceiving the troops as they returned from the village, he sounded the signal of retreat, when the whole herd, flourishing their trunks, moved rapidly into the jungle.—[Oriental Annual.

NEW-YORK AMERICAN.

MARCH 22—28, 1834.

LITERARY NOTICES.

No. XVIII.

Chicago, Jan. 10, 1834.

I have been here more than ten days, without fulfilling the promise given in my last. It has been so cold, indeed, as almost to render writing impracticable in a place so comfortless. The houses were built with such rapidity during the summer as to be mere shells; and the thermometer having ranged as low as 29 below zero during several days, it has been almost impossible, notwithstanding the large fires kept up by an attentive landlord, to prevent the ink from freezing while using it, and one's fingers become so numb in a very few moments when thus exercised, that, after vainly trying to write in gloves, I have thrown by my pen, and joined the group composed of all the household around the bar-room fire. This room, which is in an old log cabin aside of the main house, is one of the most comfortable places in town, and is, of course, much frequented, business being, so far as one can judge from the concourse that throng it, nearly at a stand still. Several persons have been severely frost-bitten in passing from door to door; and, not to mention the quantity of poultry and pigs that have been frozen, an ox, I was just told, has perished from cold in the streets at noonday. An occasional Indian, wrapped in his blanket, and dodging about from store to store after a dram of whiskey, or a muffled up Frenchman, driving furiously in his cariole on the river, are almost the only passengers abroad; while the wolves, driven in by the deep snows which preceded this severe weather, troop through the town after nightfall, and may be heard howling continually in the midst of it.

The situation of Chicago, on the edge of the Grand Prairie, with the whole expanse of Lake Michigan before it, gives the freezing winds from the Rocky Mountains prodigious effect, and renders a degree of temperature which, in sheltered situations, is but little felt, almost painful here.

> ——— The bleak winds
> Do sorely ruffle; for many a mile about,
> There's scarce a bush.

The town lies upon a dead level, along the banks of a narrow forked river, and is spread over a wide extent of surface to the shores of the lake, while vessels of considerable draught of water can, by means of the river, unload in the centre of the place. I believe I have already mentioned, that four-fifths of the population have come in since last spring: the erection of new buildings during the summer has been in the same proportion; and although a place of such mushroom growth can, of course, boast of but little solid improvement in the way of building, yet contracts have been made for the ensuing season, which must soon give Chicago much of that metropolitan appearance it is destined so promptly to assume. As a place of business, its situation at the central head of the Mississippi Valley will make it the New Orleans of the North, and its easy and close intercourse with the most flourishing Eastern cities, will give it the advantage, as its capital increases, of all their improvements in the mode of living.

There is one improvement to be made, however, in this section of country, which will greatly influence the permanent value of property in Chicago. I allude to a Canal from the head of lake Michigan to the head of steam navigation on the Illinois, the route of which has been long since surveyed. The distance to be overcome is something like twelve miles; and when you remember that the head waters of the Illinois rise within eleven miles of Chicago river, and that a level plain of not more than eight feet elevation above the latter is the only intervening obstacle, you can conceive how easy it would be to drain lake Michigan into the Mississippi by this route; boats of 18 tons having actually passed over the intervening prairie at high water. Lake Michigan which is several feet or more above Lake Erie, would afford such a never-failing body of water that it would keep steamboats afloat on the route in the dryest season. St. Louis would then be brought comparatively near to New York, while two thirds of the Mississippi Valley would be supplied by this route immediately from the markets of the latter. This canal is the only remaining link wanting to complete the most stupendous chain of inland communication in the world. I had a long conversation this morning, on the subject, with Major H., the United States Engineer, who is engaged in superintending the construction of a pier at this place. He was polite enough to sketch the main features of the route with his pencil in such a manner as to make its feasibility very apparent. The canal would pass for the whole distance through a prairie country, where every production of the field and the garden can be raised with scarcely any toil, and where the most prolific soil in the world requires no other preparation for planting than passing the plough over its bosom. The most effectual mode of making this canal would be to give the lands along its banks to an incorporated company who should construct the work within a certain time. The matter is now merely agitated at elections as a political handle.

January 13.

I had got thus far in a letter to you, when several officers of the garrison, to whom I am indebted for much hospitable attention and many agreeable hours, stopped opposite the door with a train of carioles, in one of which I was offered a seat, to witness a pacing match on the ice. There were several ladies with gentlemen in attendance already on the river, all muffled up after the Canadian fashion in fur robes, whose gay trimmings presented a rich as well as most comfortable appearance. The horses, from which the most sport was expected, were a black poney bred in the country, and a tall roan nag from the lower Mississippi. They paced at the rate of a mile in something less than three minutes. I rode behind the winning horse one heat, and the velocity with which he made our cariole fly over the smooth ice, was almost startling. The southern horse won the race; but I was told that in nine cases out of ten, the nags from his part of the country, could not stand against a French poney. In the middle of the chase, a wolf, probably roused by the sleigh-bells from his lair on the rivers' bank, trotted along the prairie above, within gun shot, calmly surveying the sport. The uninvited presence of this long-haired amateur at once suggested a hunt for the morrow, and arrangements were accordingly made, by the several gentlemen present, for that most exciting of sports, a wolf chase on horseback. I was not present at the assembling of the hunt; and the first intimation I had of the game being afoot, was from hearing the cry of hounds and the shouting of a party of horsemen, as they clattered along the frozen river, with two prairie wolves and one gray wolf, running at full speed, about a pistol shot ahead of them. One wolf was killed, and another had made his escape before I joined the party. But the third, the gray wolf, which had struck off into the prairie, was still fresh, when I came into the hunt with an untired horse. But one of the hunters had been able to keep up with him, and him I could distinguish a mile off in the prairie, turning and winding his foaming horse as the wolf would double every moment upon his tracks, while a half a dozen dogs, embarassed in the deep snow, were slowly coming up. I reached the spot just as the wolf first stood at bay. His bristling back, glaring eyes, and ferociously distended jaws, might have appalled the dogs for a moment, when an impetuous gray-hound, who had been for sometime pushing through the snow-drifts with unabated industry, having now attained a comparatively clear spot of ground, leaped with such force against the flank of the wolf as to upset him in an instant, while the greyhound shot far ahead of the quarry. He recovered himself like lightning, but not before a fierce, powerful hound, whose thick neck and broad muzzle indicated a cross of the bull-dog blood with that of a nobler strain, had struck him first upon the haunch, and was now trying to grapple him by the throat. Down again he went, rolling over and over again in the deep snow, while the *clicking* of his jaws, as he snapped eagerly at each member of the pack that by turns beset him, was distinctly audible. The powerful dog already mentioned secured him at last, by fixing his muzzle deeply into the breast of the prostrate animal. This however did not prevent the wolf giving some fearful wounds to the other dogs which beset him; and accordingly, with the permission of the gentleman who led the chase, I threw myself from my horse and gave the game the coup de grace with a dirk-knife which I carried about me. The success of this hunt induced us, upon the spot, to appoint another for to-day.

It was a fine bracing morning, with the sun shining cheerily through the still cold atmosphere far over the snow-covered prairie, when the party assembled in front of my lodgings to the number of ten horsemen, all well mounted and eager for the sport. The hunt was divided into two squads; one of which was to follow the windings of the river on the ice, and the other to make a circuit on the prairie. A pack of dogs, consisting of a gray hound or two for running the game, with several of a heavier and fiercer breed for pulling it down, accompanied each party. I was attached to that which took the river; and it was a beautiful sight, as our friends trotted off in the prairie, to see their different colored capotes and gaily equipped horses contrasted with the bright carpet of spotless white over which they rode, while the sound of their voices was soon lost to our ears, as we descended to the channel of the river, and their lessening figures were hid from our view by the low brush which in some places skirted its banks. The brisk trot into which we now broke, brought us rapidly to the place of meeting; where, to the disappointment of each party, it was found that neither had started any game. We now spread ourselves into a broad line, about gunshot apart from each other, and began thus advancing into the prairie. We had not swept it thus more than a mile, when a shout on the extreme right, with the accelerated pace of the two furthermost riders in that direction, told that they had roused a wolf. "The devil take the hindermost," was now the motto of the company, and each one spurred for the spot with all eagerness. Unhappily, however, the land along the bank of the river, on the right, was so broken by ravines, chocked up with snow, that it was impossible for us who were a half a mile from the chase when started, to come up at all with the two or three horsemen who led the pursuit. Our horses sunk to their cruppers in the deep snow drift. Some were repeatedly thrown; and one or two breaking their saddle girths, from the prodigious struggle their horses made in the snow-banks, were compelled to abandon the chase entirely. My stout roan carried me bravely through all; but when I emerged from the last ravine on to the open plain, the two horsemen who led the chase, from some inequality in the surface of the prairie, were not visible; while the third, a fleet rider, whose tall figure and Indian head-dress had hitherto guided me in the chase, had been just unhorsed, and abandoning the game afoot, was now wheeling off apparently with some other object in view. Following on the same course, we soon encountered a couple of officers in a train, who were just coming from a mission of charity in visiting the half starved orphans of a poor woman, who was frozen to death on the prairie, a day or two since—the wolves having already picked her bones before her fate became known. One by one, our whole party collected around to make their inquiries about the poor children, and the two fortunate hunters soon after joined us with a large prairie wolf hanging to the saddle bow of one of them.

It was now about eleven o'clock; we were only twelve miles from Chicago; and though we had kept up a pretty round pace considering the depth of the

snow, in coursing backward and forward since eight, our horses generally were yet in good condition, and we scattered once more over the prairie with the hope of rousing more game. Not ten minutes elapsed before a wolf, breaking from the dead weeds which shooting eight or ten feet above the level of the snow indicated the banks of a deep ravine, dashed off into the prairie pursued by a horseman on the right. He made instantly for the deep banks of the river, one of whose windings was within a few hundred yards. He had a bold rider behind him, however, in the gentleman who led the chase, (a young educated half blood, of prepossessing manners, and well connected at Chicago.) The precipitous bank of the stream did not retard this hunter for a moment, but dashing down to the bed of the river, he was hard upon the wolf before he could ascend the elevation on the opposite side. Four of us only reached the open prairie beyond in time to take part in the chase. Nothing could be more beautiful. There was not an obstacle to oppose us in the open plain; and all our dogs having long since given out, nothing remained but to drive the wolf to death on horseback. Away, then, we went, shouting on his track; the hotly pursued beast gaining on us whenever the crust of a deep snow drift gave him an advantage over the horse, and we in our turn nearly riding over him when he came to ground comparatively bare. The sagacious animal became at last aware that his course was soon up at this rate, and turning rapidly in his tracks as we were scattered over the prairie, he passed through our line and made at once again for the river. He was cut off, and turned in a moment, by a horseman on the left, who happened to be a little behind the rest; and now came the keenest part of the sport. The wolf would double every moment upon his tracks, while each horseman in succession would make a dash at, and turn, him in a different direction. Twice I was near enough to strike him with a horse-whip; and once he was under my horses feet, while so furiously did each rider push at him, that as we brushed by each other and confronted horse to horse, while riding from different quarters at full speed, it required one somewhat used—"to turn and wind a fiery Pegasus"—to maintain his seat at all. The rascal, who would now and then look over his shoulders and gnash his teeth, seemed at last as if he was about to succumb—when, after running a few hundred yards in an oblique direction from the river, he suddenly veered his course at a moment when every one thought his strength was spent; and, gaining the bank before he could be turned, he disappeared below it in an instant. The rider nearest to his heels became entangled in the low boughs of a tree, which grew near the spot; while I, who followed next, was thrown out sufficiently to give the wolf time to get out of view, by my horse bolting as he reached the sudden edge of the river. The rest of the hunt were consequently at fault when they came up to us; and, after trying in vain to track our lost quarry over the smooth ice for half an hour, we were most vexatiously compelled to abandon the pursuit as fruitless, and return to the village with only one scalp as the reward of our morning's labors.

It was with no enviable feelings, I assure you, that, on making my arrangements an hour ago to start in the new line of stages which has just been established between this point and St. Louis, I found myself compelled to part with the friend to whom I was cheifly indebted for my share in the glorious sports I have just attempted to describe to you—the four-footed companion of my last six weeks rambles. I remember being once struck with the remark of an ingenious writer, in the Library of Useful Knowledge, when, in discussing the real and the relative value of horses, he observes that, the commonest hackney, if in every respect suiting his owner, is priceless to the possessor. A favorite horse in fact, though his estimation may only depend upon the whim of his master, is one of this world's goods which, like first-love and lost confidence, the Alexandrian M. S. S. and a perfectly fitting coat, can never be thoroughly replaced. It is not, however, when the charge of such property falls exclusively to grooms and others from one end of the year to another, that you feel its value. The stall-fed palfrey which you drive along a turnpike from one hotel to another, and abandon when he falls sick for some other means of conveyance, with as little concern as you would exchange your trunk for a portmanteau, or vice versa, has but little hold on one's feelings in comparison with the hearty animal with which you wander away, where he meets with no care but such as you bestow upon him; and when you in turn become wholly dependent upon him for overcoming distances and difficulties, between places so remote from each other, that not only your comfort but sometimes your personal safety depend upon accomplishing the intervals within certain periods—when you push ahead through falling sleet, ford rivers, plunge through snow banks, or cross morasses, where the matted grass spreading its carpet over the shaking slough, embarrasses and wearies the step of your sagacious quadruped while it prevents his feet from sinking into the dangerous quagmire beneath. Those weeks of such intercourse between man and brute, are like those rainy days when one is shut up in a country house with strangers. They cherish a fellowship more cordial than years of ordinary intercourse could engender. It is no little consolation to me that I leave my Bucephalus in excellent hands; nor does this necessary separation so engross my sympathies that I have none to spare for other partings. Upon these, however, I shall not dilate here, though you must not be surprised to find me returning more than once hereafter to characters, scenes and incidents at Chicago, which I have hitherto left untouched. H.

THE PINK TIPPET, JESSAMIE COTTAGE, THE SIMPLE FLOWER, ELLEN'S VISIT. New York, *Protestant Episcopal Press.*—These are little tracts issued by the Protestant Episcopal Sunday School Union, of which the first named is among the earliest and best in composition, but much inferior to the succeeding ones in its paper and typography. The later ones are, altogether, very creditably got up.

ANGELL'S SERIES OF SCHOOL BOOKS.—We noticed some weeks ago with approbation, founded on our examination rather of the reading than the elementary portions of the work, this series of school books. A teacher who upon the strength of our remarks purchased the series, asks room to express his dissent from our opinion of these books, and to lay his reasons for that dissent before the public. We cannot refuse a request so reasonable, and so well sustained by evidence. We insert below his first number:—

ANGELL'S SERIES OF SCHOOL BOOKS.—*Mr. Editor*—The importance of correct elementary books cannot be too highly appreciated. The habits which we acquire in our childhood seem to be so interwoven with our very nature, that, even though we discover them to be erroneous, we find it exceedingly difficult to correct them. The infant mind has been aptly compared to a sheet of white paper, which receives an impression from the slightest touch of the pen, but from which a wrong mark or a blot can never be erased, and leave it fair and smooth for a second impression. Hence it is that we see many well educated men, in the constant practice of spelling and pronunciation which they themselves actually believe to be erroneous.

I have been engaged in teaching for many years, during which time I have examined a great variety of books intended for the instruction of children in the rudiments of orthography and pronunciation.—Having seen in the American a favorable notice of Mr. Angell's Series of Books, and being anxious to benefit the children under my tuition by the introduction of every thing that is in truth an improvement, I purchased a set of these books, and have given them quite a careful examination; and I regret exceedingly that my opinion of their merits is at variance with yours; but, Sir, knowing your liberality, I have written my objections briefly, and request an insertion of them in your paper.

Mr. Angell has attempted to form a continuous or collateral series of spelling and reading lessons.—Each spelling lesson is composed of words selected from the reading lesson immediately following it; and these words are thrown together in the spelling lessons without any regard to the greater ease with which one may be spelled than another, or the natural advancement of the scholar, the first three numbers containing as great or a greater proportion of difficult words than the last three. The words are also repeated very uselessly in the different lessons, while other words contained in the reading lessons, a knowledge of which is of the same importance to the scholar, are not in any of the spelling lessons, consequently, the child will never know any thing of their orthography from the perusal of them.

The orthography of these books is in my opinion very objectionable; for, in them, Mr. Angell has not followed the spelling of any standard dictionary, but has sometimes adopted that of Johnson and Walker, sometimes that of Webster, and has frequently spelled words at variance with all of them. In proof of this I will cite a few of the almost numberless instances which occur in the different volumes. No 5. page 12, *ensure* with *en*, agreeably to Walker, 208, *insurance*, with *in* agreeably to Webster; 207, *buffeting*, contrary to both; No. 2. 90, *behavior*, 3, 37, *honor*, 55, *parlor*, 4, 213 *labor*, 5, 271, *candor*, &c., without *u* agreeably to Webster; and No. 5, 200 *Saviour*, 261 *armour*, 188 *rumour*, 2, 86 *colour*, with *u* agreeably to Walker; and 2, 24 *entrusted*, 80 *poney*, 2, 90 *threshing*, 4, 244 *eazzen*, 5, 122 *rein-deer*, 274 *paralysed*, &c. &c., contrary to Walker and Webster; in none of the volumes is there either uniformity or consistency in the spelling. Not wishing to extend this communication unreasonably, I propose to send you another article in which I will treat of Mr. Angell's want of a system of pronunciation, and of his erroneous and contradictory division of words. AN OLD SCHOOLMASTER.

SUMMARY.

We inserted yesterday, on the authority of a gentleman of the Bar, a short statement of points ruled by the Supreme Court in the case of *Wheaton* vs. *Peters*. Another gentleman of the Bar informs us that that notice was not exact, and furnishes the following statement.—[National Intelligencer.]

The account of the points decided in the case of *Wheaton* against *Peters*, contained in the Intelligencer of yesterday is inexact, both in *stating* that the Court had *ruled* "every point of law in the case in favor of the appellee, Mr. Peters," and in *omitting* to state the most important principle of the law of copyright, which was actually settled in the case.

To begin with the omission:

1. The Court has *unanimously* determined (to use the words of the opinion delivered by Judge McLean) "that no Reporter has, or can have any copyright in "the *written* opinions delivered by this Court, and that "the Judges thereof cannot confer on any Reporter "any such right."

2. The Court has *not* decided that the publication of Mr. Peters' *Condensed Reports* is not an infringement of Mr. Wheaton's copyright in the 12 volumes of *Wheaton's Reports*, so far as respects the general order and arrangement of his book; the *oral* opinions delivered by the Judges from the Bench, and taken down by Mr. W. in writing; the marginal notes, or abstracts of the points decided; the statements of facts in each case, abridged by Mr. W. from the records; and the analytical indexes to each volume, which Mr. W. claims as author, and which Mr. P. has copied from Mr. W's book.

3. The Court has made no *final* disposition of the cause, but has remanded it to the Court below, with directions to ascertain, by a jury, the facts in dispute between the parties.

The Supreme Court have given judgment in favor of Rowland Stevenson, impleaded with Romington and others, at the suit of James W. Parkins, consequently the bail of Stevenson for the jail liberties, is discharged; and after four months' confinement in jail and about three months on the limits, Stevenson is once more at large.—*Courier.*

APPOINTMENTS, FEB. 19.

Kings—Peter Conover, Wm. R. Dean, Hugh Farrell, Asbury W. Kirk and Harmanus H. Borkaloo, auctioneers. Abraham S. Wright and R. M. Whiting, inspectors of lumber. John Pierce notary public. Joseph Herbert, inspector of sole leather.—States Dorson, inspector of Beef and pork. John Lott, jr. judge of the municipal court for the village Brooklyn.

New York—Peter H. Ryckman, culler of staves and heading.

We learn that on Saturday night last, a disturbance, which resulted in a serious riot, broke out among the students of the University. The dwelling of the President was attacked, the windows of the Professors broken in, and several fire-arms discharged. We did not learn that personal injury was sustained by any of the parties, nor does our informant know the particular cause of the disturbance, or in what manner it was quelled. We wait with anxiety for the particulars of this disgraceful affair, which will be doubtless furnished by our next advices from Tuscaloosa.—[Mobile Register, 6th March.]

Several lighters have come up from the brig Buenos Ayres, with sugar and rum, to Dr. Rogers & Son. The brig will probably be got off. A gentleman who arrived in town last evening, informs that he left the vessel at 3 P. M. yesterday—that they had put on board of lighters about 80 hhds. of sugar, and 12 puncheons of rum—Four lighters were left along side, sufficient to take in the residue of the cargo; and the brig, it is probable, will get off this morning.

Old Ironsides.—We understand from a source entitled to confidence, that the Board of Navy Commissioners have issued orders that the old head, which is a perfectly plain one, be replaced on the Constitution, and that her stern be also finished in a plain manner. For the honor of that noble ship, we hope the figure head, in regard to which much just indignation has been manifested, will be dispensed with. It will be in time to ornament our vessels with the busts of any man, when History shall have established his character, and pronounced him worthy of such honor.

The Rev. Dr. Ducachet, of Norfolk, Virginia, has received a unanimous call to the Restorship of St. Paul's, Philadelphia.

Important.—The Baltimore American of yesterday morning has this formidable announcement:

The following notice was handed for insertion by the Cashier of the Bank of Maryland, last night, when this paper was about going to press:—

To the Public.

Bank of Maryland,
24th March, 1834.

The Board of Directors of this Institution have ascertained with surprise and deep regret, equal to any that the community will feel, that this institution is unable to proceed with its business, and they have resolved to transfer all its effects to a Trustee, for the equal benefit of the creditors of the Bank.

The Board of Directors hope and trust that the assets will be sufficient to discharge the debts of the institution, and their determination to stop its business at once, is from a conviction that to continue it longer would only be attended with loss to the community. Their advice to the creditors, founded upon the best judgment they are able to form, is, not to sacrifice their claims. The debtors of the institution will have the privilege of paying their debts with the notes and certificates of deposite and the open accounts due by the Bank, and these alone they hope will enable the note holders and depositors speedily to realize nearly all, if not the entire amount of their credits.

By order, R. Wilson, Cashier.

Letters from Baltimore, received this morning, state that on the failure of the Maryland Bank, the whole town was in an uproar; all classes of people in motion and commotion; a run on all the Banks; such a day of excitement, one writer says, he never witnessed before. The stockholders in the Maryland Bank, will, it is said, lose all. The following facts are stated in one of the letters—our readers will make their own comments on the use thus made of the public monies.

"This Bank has been circulating vast numbers of its notes in the West; last week a draft from the the West for $150,000 was presented through the Branch Bank—the President Poulteny asked *one day.* It was granted—an express was sent to Mr. Secretary Taney, who drew on the Branch for $200,000, thus the draft on the Maryland Bank was paid, and the other $50,000 were deposited in the *Pet* Bank, the Union, which has done every thing in its power to sustain Poultney's Bank, but all in vain, though aided by the Government in the sum of $150,000."

The Bank of Maryland.—The failure of this bank, and the alleged aid extended to it by the Secretary of the Treasury, are already, it will be seen, under the consideration of the Senate of the United States. Meantime the President of this bank thus honorably meets the case of possible loss to holders of its notes by a pledge of his whole fortune:—

My confident opinion is that the Bank is able to pay all its obligations, but to obviate any difficulty whatever, and to satisfy the holders of the notes and the special certificates of the Bank, I hereby pledge my whole private estate, whether real, personal, or mixed, to redeem any deficiency that the means of the Bank may, by any possibility, be unabled to redeem.

Evan Poultney.

March 25, 1834.

Fire.—We are informed, (says the Albany Evening Journal of yesterday,) that upwards of 20 buildings were destroyed by fire last evening in Troy. All the buildings from River st. to Starbuck & Son's furnace, were consumed.

Steam Boat Napoleon.—The St. Louis Republican announces the total loss of the steam boat Napoleon, from Pittsburg for that port, heavily freighted with dry goods, &c. The boat struck a snag in the Mississippi, about twelve miles above the mouth of the Ohio. The snag passed through the bow and up to the hurricane deck, without breaking off. In this situation, by the aid of a keel boat which she had in tow, and of a steam boat, about twenty tons of the freight were got out uninjured. A great portion of the remainder will be lost, as the boat had sunk about twenty feet, and the depth of water is represented to be thirty or forty feet. Most of the goods, it is believed, were insured, principally at Eastern offices—but in one or two cases heavy loss has been sustained by the owners.

The *Canadian Giant,* well known as having exhibited himself in several countries of Europe and America, died at St. Jean des Chaillons, about 30 miles above Quebec, on the 28th ult. His name was Modeste Malhiot. His height was six feet four inches, and his weight 619 1-2 lbs. The coffin in which he was interred was three feet wide, and two feet and a half deep.

Lands sold for Taxes.—The Argus of yesterday says the sales of Monday did not go through the county of Alleghany. Next day the residue of Alleghany was gone through with, and Broome would follow.

The Supreme Court of the United States adjourned on Wednesday, 19th, after a session o sixty-six days, and having disposed of every case ready for trial. It decided 79 cases and left 41 on the docket.

Melancholy Accident.—On the evening of the 9th instant, (says the New Orleans *Advertiser,* of the 11th inst.) when some gentlemen were amusing themselves shooting with pistols at the Lake, an inexperienced young man man took in his hand a hair trigger pistol, and when in the act of preparing to shoot he touched the trigger—the pistol went off, and the ball passed through the body of Mr. B. B Butler, a highly respectable gentleman, entering at the point of the third rib, and passing out at the side of the spine. He died of hemorrhage in a few hours after the accident.

The Key West Sentinel, of the 20th ult., contains the decree of Judge Webb, awarding *fifteen per cent. salvage* to the libellants of the ship Hector and cargo, stranded on the Florida Reef, on her voyage from New York to Mobile. The value of the ship and cargo was estimated at $70,000.

Alexandria Market.—Flour has improved. Sales were made from stores on Monday at $4 20 to $4 25.

FOREIGN INTELLIGENCE.

Gilbert Stewart Newton.—It is with the greatest satisfaction we find in the London Courier the following contradiction of the paragraph from the Literary Gazette, published by us yesterday:

There is no foundation for the statement in the Literary Gazette of the death of Mr. G. S. Newton, the Royal Academician. That gentleman has been seriously indisposed, but was considerably better yesterday.—[Courier.]

From Gibraltar we have, by the favor of Mr. Regalley, of Boston, a passenger in the brig *Montano,* papers to 18th ult., furnishing Madrid dates of the 11th. There is nothing however of importance.

Late and Important from Spain—direct.—We are again indebted to Ex-Governor Cabrera for extracts from his private letters down to the 11th Feb. from Cadiz, received by the Ganges, at Boston. These tidings are considerably later from Madrid, and also later from Lisbon than the advices received via England; by which it appears that Don Pedro had gained important advantages over Don Miguel.

From Private Letters, dated

Cadiz, 11th Feb. 1834.

By the British man-of-war Stag, arrived at our port from Lisbon, we have received letters and newspapers from that capital, as late as the 3d inst. by which we find that three important victories have lately been obtained by the troops of Don Pedro against his opposers. In the afternoon of the 21st January last, in the environs of Pernes, the troops of Don Miguel, four thousand in number, attacked General Saldanha, who repelled them with such vigor and bravery that the whole of the Miguelites were entirely defeated, leaving in the hands of Saldanha more than one thousand prisoners, among them nearly a whole battalion of the 7th regiment, seven pieces of artillery and some banners. Mean while the Duke of Terceira (Villa Flor) was also attacked by another division of Miguelites, in the position of the bridge of Aseca, where the latter were equally defeated, with an immense loss.—Then the Duke sent in the direction of Villada a body of cavalry to punish 700 enemies who had passed the river Tagus from the South to the North side. All this force was entirely cut to pieces and annihilated; the few that escaped from the bayonets of the Pedroites, precipitated themselves into the river, where they were drowned. The Miguelite army, routed on every point, may now be considered as lost; the relicks will soon be extinct.

Spain.—In Spain, the partisans of Don Carlos, the Pretender, increase every day in Biscay and Navarre, where the Queen has sent a force of 30,000 men. A decree has been issued by the Queen ordering that the rebels taken with arms should be put to death if they are officers, and condemned to hard labor or transportation to Cuba, Porto Rico, or Philippine Islands if they are sergeants, corporals, or private soldiers.

The principal labor that now occupies the whole attention of the Government is the mode of convoking the Cortes or General Assembly of the Nation. The liberals enlist themselves in the ranks of the National Militia everywhere. The province of Catalonia alone has actually 30,000. They are all in expectation of the mode in which the Cortes are to be convoked, and that mode is to decide their conduct. Meanwhile, they resting on their arms, they are indignant at the past, smile at the present, and rejoice at the future. The most striking feature of the present state of the affairs in Spain is, that France and England are endeavoring to repress the general expansion of liberty, while the Captains General of the army, who had been the principal supporters of the dead tyranny, are now at the head of the liberal party.

MISCELLANY.

Laconic Epistles.—There was a celebrated diplomatist, whose time, at one period of his life, was so engaged in matters of political importance, that he could scarcely find a moment to attend to social duties, and a certain facetious colleague used to say that he never dotted his i's or crossed his t's for the purpose of saving time. It is not, therefore, probable that such a man would fritter away his precious existence in writing letters to friends upon subjects unconnected with ambition and party intrigues. He however, broke through this determination, in the following instance. A lady, with whom he was well acquainted, married a young French nobleman, the choice of her heart. Scarcely had the honeymoon passed away, when the husband was attacked with a severe illness, and died. The diplomatist being informed that the affliction of the lady was so intense, that night and day she did nothing but weep—that sorrow would soon bring her to the grave—deemed it an imperative duty to write a letter of condolence. This he performed—but, reflecting that true grief is always laconic, and wishing her to understand how alive his feelings were to the irreparable loss she had sustained, he wrote these words—and they formed the whole contents of the condoling letter: 'Ah! Madame!!"—Six months passed away, and grief and sorrow passed also away with the fleeting months. The fair lady followed the example of the Dame of Ephesus, and took to herself another husband. No sooner had the writer of protocols heard, this news, than he evinced more than usual alacrity in coming to the conclusion of writing a congratulatory epistle, which was accordingly despatched. He again reflected, that if grief be not loquacious, joy is also lacouic—and so he wrote, "Ho! ho! Madame!"

BACKGAMMON *versus* CHESS.

I am just come away from a terrible dispute with cousin Kate on the relative merits of backgammon; and to hear us at our argument you would think Bedlam was broke loose outright. I say our argument, because I am a gallant fellow: though, to put modesty on the shelf for once, the ratiocination is pretty nearly all on one side—mine, of course.—Yet, I don't know how it is, I can never bring Kate to my way of thinking—nay, she has not unfrequently the assurance to say that I am the vanquished party. Women are certainly the worst of arguers in the world; they never know when they are beaten. You may assail them with logic, you may batter them with sylogisms—what care they? You think you have got them fairly into a *reducto ad absurdum*—you have driven them to Point Nonplus—you have left them with not so much as a leg to stand upon—and straightway they take up their old position just as if nothing had happened. That's always the way

with Kate, at least. When I have outwrangled her till I am nearly black in the face, and she is reduced to a positive nonentity, calmly she spreads out her wings, like a regenerated phœnix (excuse the staleness of the simile!) and from those cinders of argumentation, raises up in all the pride of unruffled plumage. This puts me in a pet—well it may, indeed!—and then we get to "high words;" and then Kate laughs; and then I bounce out of the room; and, running to this little den of mine, set to to vindicate myself in an essay.

That's the best way of disputing, after all—the pleasantest, at any rate. You can then give your arguments fair play. If there is a weak point in your adversary's reasoning, what fine tearing work you can make of it! And if a tough objection comes in your way, how easy to misunderstand it, or skip it over altogether! Commend me to your pen argument, there is none to compare with it. It is like a grand field-day and review, where the troops are all on one side: or, if you are obliged, for candor's sake, to give yourself a few heavy lunges, no fear but you will find means to parry them—like the cat in the kitchen, you need not care being tossed head over heels a little, for there is no danger but you will come down on your legs again.

How any one can like chess moves my especial wonder. It is the dullest, the puzzlinest, and the tediousest game under the sun. There they sit, Kate and James, posing and prosing over those horses' heads and fools'-caps hour after hour, night after night. They speak but once or twice in an evening, and then only monosyllabically, "Check!"—and it seems as if a chair or a table had been suddenly endowed with speech. They can't talk themselves, and they can't be talked to. You cannot ask the civilest question but they give you a sulky answer—if, indeed they condescend to give you an answer at all. They call it *playing* at chess: monstrous perversion:—to me it seems harder work than algebra. It is the most lack lustrous of all games—it is no game at all, in fact—it is a labor, and a labor too, the most irksome that can well be imagined, It is like those "instructive games" invented for children, where they are required to twirl the tee-totum and ascertain the height of John Chinaman in a breath; where the drawing of a card or the throwing of a die leads you to the depth of the Mediterranean or the longitude of Pernambuco. Poor dear children! who could have so miserably mistaken the nature of the play—who could have forged such fetters for their souls! But, bless them, they despised the cheat—they spurned the starved snake—they tore the false sheet into ten thousand tatters—they shivered the tee-totum into ten thousand fragments! But look at the chess-players, motionless as a brace of mummies! And yet they describe their game as "very exciting." Ha! ha! only observe their faces—not a curl of the lip, not a twinkle of the eye—they have not mustered so much as a smile betwixt 'em this half hour! Once or twice, indeed, they have been "excited" to a most portentous frown; and something very like a half-suppressed "damn it" has every now and then been heard on James's side of the board. They tell you it is the game of kings—war in minature. If kings like it, well and good; one seldom hears of them playing at it. I have been a constant reader of the daily papers this—no matter how many years; I have read of his Majesty taking an airing in the Park, playing a quiet rubber at whist, sailing on Virginia Water, and going to look at the harriers at the Devil's Dyke; but I never heard of the king playing chess. As for its being an image of war (no great credit by-the-bye,) so is back gammon—so is crib bage—so is fox-and-goose. Query:—do kings ever play at fox-and-goose?

I have mentioned backgammon. Yes, backgammon is a game. What life—what spirit—what merriment—what variety! Rattle, rattle, rattle, go the dice—*bang* sixes! Brave! take you up—cover my own blot—take you up again, and complete the last point in my own table. Ha, ha! if that is not enough to make any one die with laughing, what is? Throw again—six and three—obliged to leave a blot—fours—fours, by Jove, you take me—there again—up I go, two men mast headed in a moment, and my adversery grinning from ear to ear. Ha, ha, ha!

That's what I like in backgammon. The reverses are so sudden—the ups and downs are as quick as in running hand. You have not time to brood over your ill luck, and your enjoyment is the keener for the shortness of your triumph. It is like a game at fisticuffs, where you shake hands with your antagonist before you set to, and pledge his health in a bumper when all is over. The other is far more vicious—downright French and English—war to the knife—thorough "good hating." In backgammon, you have not time to be angry; in chess, ill blood must needs grow from so long brooding. I would not willingly walk out in the dark with a man whom I had beaten at chess. You may believe it or not, as you like; but I once knew a young fellow who lost his mistress and forty thousand pounds by indiscreetly taking her queen with one of his pawns; and my uncle, who is as fond of backgammon as I am, assures me that he has heard of a person who, having been stale mated when on the point of winning a long contested game, took it so much to heart that he cut his carotid artery three weeks after. For my part, I never could properly understand chess—it is such in-and-out, three-cornered work. The rooks, bishops, and pawns, I could manage well enough; but those horrid horses' heads, they always perplexed me. And then that *castling the king*, I never could remember, from one time to another how it was done; and never saw the use of it when it was done. Most people, I believe, play at chess because they think it fine to do so; young ladies, because they fancy it argues a masculine mind—young men, because it hides their stupidity—retired tallow-chandlers, because they think it genteel. I was once fool enough to be dazzled by the glitter of the red and white, studied Phillidor, and went to see the automaton. But the fit was not of long duration—I soon cut my wisdom-teeth—I soon returned to dear old backgammon; and I wish, reader, you and I could have a hit together at this moment. I can never tire of backgammon. It is like "Sweet Home," (the song, I mean,) you cannot have too much of it; the appetite here "grows by what it feeds on," (really our quotations and similes are shockingly antique;) it is like bread and cheese, of which it is said, the more you eat the hungrier you get. It unwearies the mind, and *rectifies* the spirits. It turns a Nero into an Augustus, and a Cymon into a Cæsar. The very sight of a backgammon-board is enough to put me into good humor. Those stripes of crimson and grey, how pleasant they be, like the glowing clouds of a summer sunset, or the brilliant corusc ations of the Aurora Borealis! How different the arena of the chess war! It always puts me in mind of the symbol on an alehouse window. It deserves no better than to be played on a shutter.

Backgammon is essentially a gay game. It is not to be played with solemn thoughts and sour faces. You ought to laugh every time you throw, and if you have not a jest ready for every "doublets," you don't deserve to throw doublets again as long as you live. As backgammon is a game almost entirely of chance, it will scarcely be in good taste to make such stand upon your skill. Less is it to be endured that you should be constantly referring to Hoyle, for the maintenance of some vexatious rule or foolish courtesy. If a man stand shilly-shallying over a blot, or hesitates to take one of your men, for fear of consequences, beware how you lend him your money, or entrust him with the title deeds of your house! If a man insults you by pedantically quoting and resolutely maintaining antiquated laws, such as "If you touch a man you must move it, and if you relinquish it you cannot recall it," shut the board in his face, ring for your slippers, and go to bed. I was once called in to bail a fellow with whom I had long been on terms of intimacy. We played a game or two at backgammon in the spunging house. I threw six times, one on one side of the board, one on the other. He protested it was against the rules of the game, and insisted on my throwing again. I took up my hat, left the room, suffered my friend to go to prison. Did I not serve him rightly?

The only objection I ever heard against backgammon was its want of sociality, only two can play at it. This is the objection of my very good friends, the whist players. But I don't consider it an objection: far from it—it is an advantage. There is seldom more than one person in a company that you are to concern yourself about; a friend, perhaps, or a sweetheart. If a friend, how delightful an opportunity it affords you for a *tête a tête!* You go on playing and joking, rattling the dice, and squibbing off puns, as pleasantly as sunshine in a hayfield.—The game no more interrupts your thoughts than a gale interrupts the serenity of the deeps. It is to your discourse what the accompaniment is to a song: it is as animating as a trumpet is to a war horse, or a view-hollo to a fox hunter, or a pair of bagpipes to a Scotchman. In the case of a sweetheart, the game is positively invaluable. To the lady herself, what opportunities it affords for the display of a well turned arm; how daintily her little fingers curved about among the men; how brilliantly glance her bright eyes, smiling over some lucky throw! And to *you* a *fete champetre*, or a fancy ball, gives not half the facilities. I never was in love but once in my life, and then I used to pay my addresses through the medium of the backgammon board. Oh! Mary Rose W———! (Mrs. Jacob Jenkinson now,) Oh! Mary Rose! (Rosemary I used to call you in our more playful moments,) what billings and cooings have we had over that mock "History of England" of your old aunt's? What tender things have we said under cover of the dice-box! what sighs have we mingled with the rattling of the men! how very close have we brought our lips (all but kissing) under pretence of disputing about a throw, or ascertaing the length of a six-and-five! How often, too, when your poor aunt has looked up from the "Whole Duty of Man," and seen us leaving blot after blot, and throwing helter-skelter, and playing into the wrong table, and taking up our own men instead of our adversary's—how often has she startled us with her old favorite exclamation, "Hey day! now now?" and how have you blushed, Mary, at being convicted of a sigh or an ogle! and how have I stammered out an excuse for my fingers, which were haply caught playing themselves amongst your jetty ringlets, or for my toe, which was making love to *your* toe under the little rosewood table! Oh! Mary, Mary! those were happy days! my heart and your heart, Mary ———. But, as I said before you are Mrs. Jacob Jenkinson now, and I mustn't say a word of tenderness in your matronly ear, lest that stockbrokering husband of your's should take it into his head to sue for damages. Oh! Mary, Mary, how *could* you think of marrying into the 3 per cent. Consols,—to be dinned to death with the slang of Capel-court,—to give birth to nothing but bulls and bears?

I have known a game of chess to last two, three or even four evenings. That seems bad enough; but what must one think when it comes to be spun out for as many months,—to be played through the medium of the General Post Office, and hundreds of miles intervene betwixt each move? Madness, madness! I was once challenged to play a game through the Twopeany, but I declined with indignation. The challenger showed me a letter he had that morning received from an adversary in Edinburgh, and he expected another, he said, by the next vessel from India. The Edinburgh letter ran thus: "Dear Phil,—By moving pawn No. 4 one square forward, you will very much oblige,—Dear Phil, your's very sincerely.—John Johnstone." This fact alone is, in my mind, enough to damn chess.—What affectation! what folly! Did any one ever hear of a game of backgammon being played after such foolish fashion? Never, I'll be bound for it. Then, the airs of superiority the chessites assume over us boor backgammonists, and utter contempt they profess for our game! Why, the fact is, that our game is as superior to their's as silver to saw-dust. In chess two players must either be equal or unequal. If equal they see through each other's manœuvres in a minute; and the game (if not prolonged till both parties are heartily sick of each other, and so dropped from mere weariness) is lost at last by an oversight,—the loser not considering himself beaten.—If unequal, a certain number of moves places the weaker party *hors de combat*, and that as often as the game may happen to be renwed.

In backgammon nothing of this sort takes place.—The most practised player may be beaten by the veriest tyro. Old grandpapa may be gammoned by his little curly-headed granddaughter. Luck's all. Fortune governs throughout: conjecture is positively dumbfounded. A chancery suit or an action for libel can scarcely be more uncertain in its results. At backgammon all men are fatalists. Many fine moral lessons are contained in its leafless book. The "Talmud" and the "Koran" are not more full of ethical instruction than those two volumes of antitypes. They teach us how vain are all our calculations of the future—how foolish it is for man to trust to his own predictions in matters over which himself has no control. They counsel us to look with suspicion on present good fortune, yet never to despair in the midst of adversity. Let no man be puffed up with pride; his pride may have a fall; let no man despond at the presence of poverty; he may throw sixes! Backgammon instils into our minds the rudiments of honorable competition: of course, it is no game for the St. Simonians; it teaches us that all mankind are equal,—black and white. It is a microcosm, in which the men represent the brute matter, and the dice the informing principle. If chess is a game for kings, backgammon is a recreation for the immortal gods themselves.

A noble game is backgammon—as I think cousin Kate will acknowledge when she comes to cast her fine black eyes over this most veritable and unsophisticated essay.

CONSUMPTION OF SILK.—The quantity of this material used in England, alone amounts each year to more than four millions of pounds weight, for the production of which, myriads upon myriads of insects are required. Fourteen thousand millions of animated creatures annually live and die to supply this corner of the world with this luxury! If astonishment be ascribed at this act, let us extend our view to China, and survey the dense population of its widely spread region, whose inhabitants, from the emperor on the throne to the peasant in the lowly hut, are indebted for their clothing to the labors of the silk worm. The imagination, fatigued with the flight, is lost and bewildered in contemplating the countless numbers which every successive year spin their slender threads for the service of man.—[Repertory of Patent Inventions.]

A few days ago two Savoyards, travelling the country with two dancing bears, were overtaken by night on the road, and put up at a public house near Dolbe, in Calvados. Having shut up their animals in the stable, they entered the house, and after taking some refreshments, began to count their gains during the day. While thus occupied a stranger came in, and entered into conversation with them. The account being made up, and the money put into a leathern purse, one of the bear-leaders was observed by their new companion, who seems to have had some of the qualities of the fox, but not all his cunning, to carry the purse into the stable, and return empty handed. The hour of rest arrived, the party separated, and each retired. About midnight, however, the traveller, who had watched the visit to the stable, but was not aware of how the stalls were occupied, went furtively there, in hopes of finding the deposited treasure. No sooner, however, had he entered within the door than he found himself in the embraces of a rough and powerful being, with claws that entered his flesh, and so completely destroyed all his discretion that he was forced to cry out lustly for assistance. The fact was, that the bear-leaders, knowing the fidelity of their two rough-coated companions, had followed their usual custom of placing their little treasure between them for safe custody. On the following day the would-be thief was pursued to the house and arrested for a depredation he had previously committed.—[French paper.]

Ludicrous Misunderstanding.—Mr. Crabbe had, I presume, read very little about Scotland before that excursion. It appeared to me that he confounded the Incheolm of the Frith of Forth with the Icolmkil of the Hebrides; but John Kemble, I have heard, did the same. I believe he really never had known until then that a language radically distinct from the English was still actually spoken within the island. And this recalls a scene of high merriment which occurred the very morning after his arrival. When he came down into the breakfast parlor, Sir Walter had not yet appeared there, and Mr. Crabbe had before him two or three portly personages, and all in the full Highland garb. These gentlemen, arrayed in a costume so novel, were talking in a language which he did not understand, so he never doubted that they were foreigners. The Celts, on their part, concived Mr. Crabbe, dressed as he was in rather an old-fashioned style of clerical propriety, with buckles in his shoes for instance, to be some learned abbé, who had come on a pilgrimage to the shrine of Waverly; and the result was, that when, a little afterwards, Sir Walter and his family entered the room, they found your father and these worthy lairds hammering away, with pain and labour, to make themselves mutually understood in most execrable French. Great was the relief, and potent the laughter, when the host interrupted their colloquy with his plain English "Good morning."—[Crabbe's Life, by his Son.]

From two volumes recently published in London, under the title of "The Doctor," in which much clever writing is displayed, and solid instruction on miscellaneous subjects imparted, we have transferred some extracts to our paper to-day:

Love of Country.—Whatever strengthens our local attachments is favorable both to individual and national character. Our home—our birth-place—our native land—think for awhile what the virtues are which arise out of the feelings connected with these words; and if thou hast any intellectual eyes thou wilt then perceive the connexion between topography and patriotism. Show me a man who cares no more for one place than another, and I will show you in that same person one who loves nothing but himself.—Beware of those who are homeless by choice!—You have no hold on a human being whose affections are without a tap-root. The laws recognize this truth in the privileges which they confer upon freeholders; and public opinion acknowledges it also, in the confidence which it reposes upon those who have what is called a stake in the country.

"I don't like morality it doses. * *

"Nothing excellent was ever produced by any author who had the fear of censure before his eyes." * * * *

A Quack Medicine.—"When at any time it happened that one of his eyes was blood-shot, he went forthwith in search of some urchin, whose mother, either for laziness, or in the belief that it was wholesome to have it in that state, allowed his ragged head to serve as a free warren for certain 'small deer.' One of these hexapods William secured, and 'using him as if he loved him,' put it into his eye; when, according to William's account, the insect fed upon what it found, cleared the eye, and disappearing he knew not where or how, never was seen more. * * * *

Time is a commodity of which the value rises as long as we live."

The Laws and Lawyers again.—He knew that laws were necessary evils; but he thought they were much greater evils than there was any necessity that they should be; and believing this to be occasioned by those who were engaged in the trade of administering them, he looked upon lawyers as the greatest pests in the country:

> Because their end being merely avarice,
> Winds up their wits to such a nimble strain
> As helps to blind the judge, not give him eyes.
> *Lord Brooke.*

Bell ringing.—"It would take ninety-one years to ring the changes upon twelve bells, at the rate of two strokes to the second; changes upon fourteen could not be rung through at the same rate in less than 16,575 years; and upon four and twenty they would require more than 117,000 billions of years. Great, then, are the mysteries of bell-ringing! And this may be said in its praise, that of all devices which men have sought out for obtaining distinction by making a noise in the world, it is the most harmless."

Intelligence.—Let me observe, that I never obtained any information of any kind which did not on some occasion or other prove available.

Age.—In age we dislike all changes as naturally, and, therefore, no doubt, as fitly, as in youth we desire it.

Local Attachments.—If fifty years' acquaintance did not give us some regard even for stocks and stones, we must be socks and stones ourselves.

Quare in Education.—If I had been born too poor to obtain the blessings of education, or too rich to profit by them.

Advice.—They who cannot swim should be contented with wading in the shallows: they who can, may take the deep water, no matter how deep, so it be clear. But let no one dive in the mud.

Marriage.—The man who is married for mere worldly motives, without a spark of affection on the woman's part, may nevertheless get, in every worldly sense of the word, a good wife; and while English women continue to be what, thank Heaven, they are, he is likely to do so: but when a woman is married for the sake of her fortune, the case is altered, and the chances are five hunered to one that she marries a villain, or at best a scoundrel. * * To set about seeking a wife is like seeking one's fortune, and the probability of finding a good one in such a quest is less, though poor enough, Heaven knows, in both cases. * * * *

The man who gets in love because he has determined to marry, instead of marrying because he is in love, goes about to private parties and to public places in search of a wife; and there he is attracted by a woman's appearance, and the figure which she makes in public, not by her amiable deportment, her domestic qualities, and her good report. Watering places might with equal propriety be called fishing places, because they are frequented by female anglers, who are in quest of such prey, the elder for their daughters, the younger for themselves. But it is a dangerous sport, for the fair Piscatrix is not more likely to catch a bonito, or a darado, than she is to be caught by a shark.

The Turkish Language.—No people have pretended to so much precision in their language as the Turks. They have not only verbs active, passive, transitive and reciprocal, but also verbs co-operative, verbs meditative, verbs frequentative, verbs negative, and verbs impossible; and moreover they have what are called verbs of opinion, and verbs of knowledge. The latter are used when the speaker means it to be understood that he speaks of his own sure knowledge, and is absolutely certain of what he asserts; the former when he advances it only as what he thinks likely, or believes upon the testimony of others.

Feelings.—You meet in this world with false mirth as often as with false gravity; the grinning hypocrite is not a more uncommon character than the groaning one. As much light discourse comes from a heavy heart as from a hollow one; and from a full mind as from an empty head.

Eyes.—Mirth sparkled in them, scorn flashed from them, thought beamed in them, benevolence glistened in them; that they were easily moved to smiles, easily to tears.

Confirmed Habits.—Every one knows the story of the tallow chandler, who, having amassed a fortune, disposed of his business, and taken a house in the country, not far from London, that he might enjoy himself, after a few months trial of a holiday life, requested permission of his successor to come into town, and assist him on melting days. I have heard of one who kept a retail spirit shop, and having, in like manner, retired from trade, used to employ himself by having one puncheon filled with water, and measuring it off by pints into another. I have heard also, of a butcher in a small country town, who, some little time after he had left off business, informed his old customers that he meant to kill a lamb once a week, just for his amusement.

Cambridge Anecdote.—Some of my contemporaries may remember a story once current at Cambridge, of a luckless undergraduate, who being examined for his degree, and failing in every subject upon which he was tried, complained that he had not been questioned upon the things which he knew. Upon which the examining master, moved less to compassion by the impenetrable dulness of the man than to anger by his unreasonable complaint, tore off about an inch of paper, and, pushing it towards him, desired him to write upon that all he knew!

Singularity.—Of all things, a wise man will most avoid any ostentatious appearance of singularity.

Woman.—Man hath a fleece about him which enables him to bear the buffetings of the storm; but woman, when young, and lovely, and poor, is as a shorn lamb, for which the wind has not been tempered.

Disquisition in Praise of Order.—Think a moment, I beseech thee, reader, what order is! Not the mere word which is so often vociferated in the House of Commons, or uttered by the Speaker *ore rotundo*, when it is necessary for him to assume the tone of Ζευς υψιβρεμετης; but order in its essence and truth, in itself and in its derivatives. Waving the orders in council, and the order of the day, a phrase so familiar in the disorderly days of the French National Convention, think, gentle reader, of the order of knighthood, of holy orders, of the orders of architecture, the Linnæan orders, the orderly serjeant, the ordinal numbers, the ordinary of Newgate, the ordinary on Sundays at two o'clock in the environs of the metropolis, the ordinary fases of those who partake of what is ordinarily provided for them there; and under the auspices of government itself, and *par excellence*, the extraordinary Gazette. And as the value of health is never truly and feelingly understood, except in sickness, contemplate for a moment what the want of order is. Think of disorder in things remote, and then as it approaches thee. In the country wherein thou livest, bad; in the town whereof thou art an inhabitant, worse; in thine own street, worser; in thine own house, worst of all. Think of it in thy family, in thy fortune, in thine intestines. In thy affairs, distressing; in thy members, painful; in thy conduct, ruinous. Order is the sanity of the mind, the health of the body, the peace of the city, the security of the state. As the beams to a house, as the bones to the microcosm of man, so is order to all things. Abstract it from a dictionary, and thou mayest imagine the inextricable confusion which would ensue. Reject it from the alphabet, and Zerah Colburn himself could not go through the chriscross row. How then should I do without it in this history? A Quaker, by name Benjamin Lay, (who was a little cracked in the head, though sound at heart,) took one of his compositions once to Benjamin Franklin that it might be printed and published. Franklin having looked over the manuscript, observed, that it was deficient in arrangement. 'It is no matter replied the author,' 'print any part thou pleasest first.' Many are the speeches and the sermons and the treatises and the poems, and the volumes,

which are like Benjamin Lay's book: the head might serve for the tail, and the tail for the body, and the body for the head,—either end for the middle, and the middle for either end; nay, if you could turn them inside out like a polypus, or a glove, they would be no worse for the operation. When the excellent Hooker was on his death-bed, he expressed his joy at the prospect of entering a world of order."

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WILLIAM NORRIS, Secretary.

December 3d, 1833.

For further information on this subject see No. 49, page 778 of this Journal. 86

TO STEAMBOAT COMPANIES.

☞ PROFESSOR RAFINESQUE, of Philadelphia, offers his services to render steamboats incombustible, and not liable to sink, even by the bursting of boilers, or striking against snags, sawyers and rocks. This will save many boats, much property, and the lives of hundreds every year. Those who neglect this easy improvement, deserve to be neglected and deserted by the public as unmindful of safety. Apply, post paid. S1 R J M M & F

☞ TOWNSEND & DURFEE, of Palmyra, *Manufacturers of Railroad Rope*, having removed their establishment to Hudson, under the name of *Durfee, May & Co.* offer to supply Rope of any required length (without splice) for inclined planes of Railroads at the shortest notice, and deliver them in any of the principal cities in the United States. As to the quality of Rope, the public are referred to J. B. Jervis, Eng. M. & H. R. R. Co., Albany; or James Archibald, Engineer Hudson and Delaware Canal and Railroad Company, Carbondale, Luzerne county, Pennsylvania.

Hudson, Columbia county, New-York, January 29, 1833.

ALBANY SEED-STORE AND HORTICULTURAL REPOSITORY.

The subscriber having resumed the charge of the above establishment, is now enabled to furnish traders and others with FRESH GARDEN SEEDS, upon very favorable terms, and of the growth of 1833, *warranted* of the best quality.

The greatest care and attention has been bestowed upon the growing and saving of Seeds, and none will be sold at this establishment excepting those raised expressly for it, and by experienced seedsmen; and those kinds imported which cannot be raised to perfection in this country; these are from the best houses in Europe, and may be relied upon as genuine.

It is earnestly requested whenever there are any failures hereafter, they should be represented to the subscriber; not that it is possible to obviate unfavorable seasons and circumstances, but that satisfaction may be rendered and perfection approximated.

Also—French Lucern, White Dutch Clover, White Mulberry Seed, genuine Mangel Wurtzel, Yellow Locust, Ruta Baga, and Field Turnip Seeds, well worth the attention of *Farmers*.

W. THORBURN,
347 N. Market st. (opposite Post Office.)

☞ Catalogues may be had at the Store; if sent for by mail, will be forwarded gratis. Orders solicited early, as the better justice can be done in the execution.

*** Mr. Thorburn is also Agent for the following publications, to wit:—

New York Farmer and American Gardener's Magazine.

Mechanics' Magazine and Register of Inventions & Improvements.

American Railroad Journal and Advocate of Internal Improvements; and the

New-York American, *Daily, Tri-Weekly*, and *Semi-Weekly; either* or *all* of which may be seen and obtained by those who wish them, by calling at 347 *North Market street, Albany*.

SURVEYORS' INSTRUMENTS.

☞ Compasses of various sizes and of superior quality, warranted.

Leveling Instruments, large and small sizes, with high magnifying powers with glasses made by Troughton, together with a large assortment of Engineering Instruments, manufactured and sold by E. & G. W. BLUNT, 154 Water street, J31 6t corner of Maidenlane.

ENGINEERING AND SURVEYING INSTRUMENTS.

☞ The subscriber manufactures all kinds of Instruments in his profession, warranted equal, if not superior, in principles of construction and workmanship to any imported or manufactured in the United States; several of which are entirely *new*: among which are an Improved Compass, with a Telescope attached, by which angles can be taken with or without the use of the needle, with perfect accuracy—also, a Railroad Goniometer, with two Telescopes—and a Levelling Instrument, with a Goniometer attached, particularly adapted to Railroad purposes.

WM. J. YOUNG,
Mathematical Instrument Maker, No. 9 Dock street, Philadelphia.

The following recommendations are respectfully submitted to Engineers, Surveyors, and others interested.

Baltimore, 1832.

In reply to thy inquiries respecting the instruments manufactured by thee, now in use on the Baltimore and Ohio Railroad. I cheerfully furnish thee with the following information. The whole number of Levels now in possession of the department of construction of thy make is seven. The whole number of the "Improved Compass" is eight. These are all exclusive of the number in the service of the Engineer and Graduation Department.

Both Levels and Compasses are in good repair. They have in fact needed but little repairs, except from accidents to which all instruments of the kind are liable.

I have found that thy patterns for the levels and compasses have been preferred by my assistants generally, to any others in use, and the Improved Compass is superior to any other description of Goniometer that we have yet tried in laying the rails on this Road.

This instrument, more recently improved with a reversing telescope, in place of the vane sights, leaves the engineer scarcely any thing to desire in the formation or convenience of the Compass. It is indeed the most completely adapted to laterial angles of any simple and cheap instrument that I have yet seen, and I cannot but believe it will be preferred to all others now in use for laying of rails—and in fact, when known, I think it will be as highly appreciated for common surveying.

Respectfully thy friend,
JAMES P. STABLER, Superintendant of Construction of Baltimore and Ohio Railroad.

Philadelphia, February, 1833.

Having for the last two years made constant use of Mr. Young's "Patent Improved Compass," I can safely say I believe it to be much superior to any other instrument of the kind, now in use, and as such most cheerfully recommend it to Engineers and Surveyors. E. H. GILL, Civil Engineer.

Germantown, February, 1833.

For a year past I have used Instruments made by Mr. W. J. Young, of Philadelphia, in which he has combined the properties of a Theodolite with the common Level.

I consider these Instruments admirably calculated for laying out Railroads, and can recommend them to the notice of Engineers as preferable to any others for that purpose.

HENRY R. CAMPBELL, Eng. Philad., Germant. and Norrist. Railroad

m1 1y

STEPHENSON,

Builder of a superior style of Passenger Cars for Railroads

No. 264 Elizabeth street, near Bleecker street, New-York.

☞ RAILROAD COMPANIES would do well to examine these Cars; a specimen of which may be seen on that part of the New-York and Harlem Railroad, now in operation.

J25 tf

RAILROAD CAR WHEELS, BOXES AND AND OTHER RAILROAD CASTINGS.

☞ Also, AXLES furnished and fitted to wheels complete at the Jefferson Cotton and Wool Machine Factory and Foundry, Paterson, N. J. All orders addressed to the subscribers at Paterson, or 60 Wall street, New-York, will be promptly attended to. Also, CAR SPRINGS.

Also, Flange Tires turned complete.

J8 ROGERS, KETCHUM & GROSVENOR.

NOVELTY WORKS,

Near Dry Dock, New-York.

☞ THOMAS B. STILLMAN, Manufacturer of Steam Engines, Boilers, Railroad and Mill Work, Lathes, Presses, and other Machinery. Also, Dr. Nott's Patent Tubular Boilers, which are warranted, for safety and economy, to be superior to any thing of the kind heretofore used. The fullest assurance is given that work shall be done well, and on reasonable terms. A share of public patronage is respectfully solicited. m18

INSTRUMENTS.

SURVEYING AND NAUTICAL INSTRUMENT MANUFACTORY.

☞ EWIN & HEARTTE, at the sign of the Quadrant, No. 53 South street, one door north of the Union Hotel, Baltimore, beg leave to inform their friends and the public, especially Engineers, that they continue to manufacture to order and keep for sale every description of Instruments in the above branches, which they can furnish at the shortest notice, and on fair terms. Instruments repaired with care and promptitude.

For proof of the high estimation on which their Surveying Instruments are held, they respectfully beg leave to tender to the public perusal, the following certificates from gentlemen of distinguished scientific attainments.

To Ewin & Heartte.—Agreeably to your request made some months since, I now offer you my opinion of the Instruments made at your establishment, for the Baltimore and Ohio Railroad Company. This opinion would have been given at a much earlier period, but was intentionally delayed, in order to afford a longer time for the trial of the Instruments, so that I could speak with the greater confidence of their merits, if such they should be found to possess.

It is with much pleasure I can now state that notwithstanding the Instruments in the service procured from our northern cities are considered good, I have a decided preference for those manufactured by you. Of the whole number manufactured for the Department of Construction, to wit: five Levels, and five of the Compasses, not one has required any repairs within the last twelve months, except from the occasional imperfection of a screw, or from accidents, to which all Instruments are liable.

They possess a firmness and stability, and at the same time a neatness and beauty of execution, which reflect much credit on the artists engaged in their construction.

I can with confidence recommend them as being worthy the notice of Companies engaged in Internal Improvements, who may require Instruments of superior workmanship.

JAMES P. STABLER,
Superintendent of Construction of the Baltimore and Ohio Railroad.

I have examined with care several Engineers' Instruments of your Manufacture, particularly Spirit levels, and Surveyor's Compasses; and take pleasure in expressing my opinion of the excellence of the workmanship. The parts of the levels appeared well proportioned to secure facility in use, and accuracy and permanency in adjustments.

These instruments seemed to me to possess all the modern improvement of construction, of which so many have been made within these few years; and I have no doubt but they will give every satisfaction when used in the field.

WILLIAM HOWARD, U. S. Civil Engineer.

Baltimore, May 1st, 1833.

To Messrs Ewin and Heartte—As you have asked me to give my opinion of the merits of those instruments of your manufacture which I have either used or examined, I cheerfully state that as far as my opportunities of my becoming acquainted with their qualities have gone, I have great reason to think well of the skill displayed in their construction. The neatness of their workmanship has been the subject of frequent remark by myself, and of the accuracy of their performance I have received satisfactory assurance from others, whose opinion I respect, and who have had them for a considerable time in use. The efforts you have made since your establishment in this city, to relieve us of the necessity of sending elsewhere for what we may want in our line, deserve the unqualified approbation and our warm encouragement. Wishing you all the success which your enterprize so well merits, I remain, yours, &c.

E. H. LATROBE,
Civil Engineer in the service of the Baltimore and Ohio Railroad Company.

A number of other letters are in our possession and might be introduced, but are too lengthy. We should be happy to submit them upon application, to any person desirous of perusing the same. m19

METEOROLOGICAL RECORD, KEPT AT AVOYLLE FERRY, RED RIVER, LOU.

For the month of January, 1834—(Lat. 31.10 N., Long. 91.59 W. nearly.)

Date. 1834.	Thermometer. Morn'g.	Noon.	Night.	Wind.	Weather, Remarks, &c.
Jan'ry 1	51	54	53	NE—light	cloudy—{distant heavy thunder a. m.—at 4 p. m. a severe thunder shower from s to w—at 7 p. m. wind w to N—high all night*
" 2	34	36	33	N—high	" —wind high all day and night
" 3	32	34	32	"	clear—night cloudy—Red River at a stand
" 4	26	26	24	N	cloudy—snow at 9 a. m. to 1 p. m., one inch deep—night clear
" 5	16	30	28	calm	clear—light clouds—night clear—severe freeze
" 6	24	38	35	"	" —snow left in the shade, where the the sun shone all gone
" 7	21	45	44	s—light	" morning—white frost—snow gone—evening and night cloudy—Red
" 8	42	52	50	NE—light	cloudy—pumpkins froze [River rising
" 9	46	50	66	SE—light	" —heavy thunder and rain—evening and night drizzling, steady
" 10	56	73	70	"	" —showers all day and night
" 11	69	76	72	s	" " " "
" 12	67	64	54	NW—high	" " a. m —evening clear—wind N, high
" 13	39	43	42	N	" " all day—and all night drizzling
" 14	38	42	39	calm	" " " " "
" 15	42	50	54	"	" " " " "
" 16	58	64	63	s—light	" " " " "
" 17	65	71	70	"	" " some sunshine " "
" 18	68	73	68	"	" " " " "
" 19	67	72	70	calm	" " " " "
" 20	66	71	72	"	" —foggy morning—evening light clouds and sunshine
" 21	50	49	41	N—high	" —light rain or drizzling all day and night
" 22	36	45	43	N—light	" " " " "
" 23	39	47	46	calm	" " " " "
" 24	42	46	45	"	" " " " "
" 25	48	62	70	"	" " evening light clouds, and wind s, light
" 26	59	53	51	NE	" "
" 27	37	33	36	"	" —rain all day, with some hail—and night hail and sleet
" 28	32	35	34	N	" —snowing light all day—and drizzling and hail all night
" 29	32	28	37	calm	" " " " " "
" 31	38	54	54	"	" evening, sun visible through light clouds
" 30	40	44	42	w—high	" " sunshine and night clear

* Red River rising—below high water mark 11 feet 2 inches.

Red River rose this month 3 feet 5 inches—below high water, 7 feet 9 inches.

Avoylle Ferry, on Red River, Lou., February 8th, 1834.

To the Editor of the Railroad Journal:

SIR—Inclosed is the range of the Thermometer for the month of January, regularly entered as stated. It has been the most extraordinary month ever noticed in this part of the country, for cold—cloudy—rains—and changes of weather. Most respectfully,

Your most ob't servant,

P. G. VOORHIES.

P. S.—I wrote you particularly on 3d January, ultimo.

[We are much obliged to our worthy correspondent for a continuance of his communications and regret, to say that the one above referred to, of 3d January, has not been received, more especially on account of the interruption it causes in our thermometrical record.—ED.]

COMMERCIAL RECORD.

Report of the New York Market, Thursday, March 27, 1834.

ASHES—Pots continue in tolerable request at 4 30, while Pearls are only in moderate request at 4 60.

COAL—Sales were made of unbroken Schuylkill by auction at 4 37a4 50.

COFFEE—Sales of Laguira green at 11 1-2 cts.

COTTON—There is a little more demand for home use, and prices are sustained. Sales of Upland at 11a12 1-2, and New Orleans 12 1-2a13 1-2 cts.

FLOUR—Has advanced full 25 cents a barrel since Saturday. Sales of common brands Western at 5 dolls.; Howard st. 4 87; Philadelphia 5; and New Orleans at 4 50.

GRAIN—Is dull; some sales of Ohio, via. New Orleans Wheat at 1 dollar.

MOLASSES—Considerable sales since our last, of New Orleans at 30 cts.; Porto Rico 30a32, and Havana 24 cts.

No change in the prices of Sugar or Spirits.

The Sabina's cargo of Teas is announced for Tuesday.

Cattle Market—Upper Bull's Head, New-York, March 24.

BEEVES—420 head in market, including 50 left over from last week. The cattle were of fair quality, and the demand about the same as last week. 375 were sold at an advance of 12 1-2 cts pr cwt on former prices. Prime sold at $7 50; good, $6 50a$7; ordinary, $5 50a7—average, 6 62 1-2 per cwt.

SHEEP—There was but a small supply in market, and sales were rather dull. Some were sold at from $3 to 6, according to quality.

COWS AND CALVES—Are dull. Some sales at $23, 25, 28 and 30.

Cincinnati, March 19.

FLOUR—The arrivals during the last week have been small. It is bought up as fast as it arrives, at $2 75 and the inspection.

WHISKEY—But little in market. We quote at 18 1-4—in demand.

BALTIMORE MARKETS—*March 25.*

There are no transactions from stores in Howard street Flour. The few loads coming in are taken from wagons at $4 25 No sales of City Mills Flour

There is but little doing in any kind of Grain, and the market appears to be without change.

Whiskey in hhds. we quote at 21 cents in large lots, and 21½ cts in small lots. The wagon price of bbls is 20 cts, exclusive of the barrel.

CHARLESTON PRICE CURRENT, March 22.

Home Productions.

COTTON—Sea Island 25 a 35; Stained 10 a 16.
Maine 22 a 25.
Santee 20 a 24.
Short staple 10 a 12½.
RICE—Inferior to good 2 a 2½; prime 2¾ a 2¾.
FLOUR—Philadelphia, Baltimore, and Richmond. $5 a 5¼.
CORN—50 a 75; OATS 38 a 43; PEAS 56 a 70.
BACON—7 a 8½ cents; HAMS—9 a 10½.
LARD—8 a 9 cents; SOAP—Yellow 6 a 7.
BALE ROPE—5 a 10 cents.
OIL—Sperm. 90 a 110 cents per gallon.

Foreign Productions.

BAGGING—Dundee, and Inverness, 42 inch 24 a 25; Tow and Flax do 18 a 22.
OSNABURGS—9½ a 11.
IRON—Assorted Russia and Swedes, 100 lbs. $4 a 4½.
SALT—Liverpool, coarse in bags of 4 bushels, $1.31 a 1.37; In bulk 28.
Turks Island 50.
SUGAR—Havana, white 9 a 10½; brown 7¾ a 8.
Muscovade 8 a 10; St. Croix and Jamaica 9½ a 10½; New Orleans 7½ a 9.

REMARKS—COTTON—There has been a very fair demand for Uplands during the week from 10 to 12½; the sales have been principally in the finer qualities, although there has been a good demand for the inferior descriptions. There has been a good demand for long Staple also this week at our quotations.

RICE.—The market still continues heavy and a few sales that have been, were made at a reduction of 1-8 to 3-16ths of a dollar.

FLOUR.—This article remains dull.

GRAIN.—There have been pretty extensive sales this week.

[*From the New Orleans Price Current, of March 8.*]

REMARKS.—The past week has been obscured by a daily and regular succession of rain and fog, the streets are again covered with liquid mud, and we are reminded occacionally, in the course of twenty-four hours, of changes indicative of the four seasons. It is hardly necessary to add, that out door affairs are retarded in consequence; freight cannot be transported to the shipping without much risk of injury, and that already deposited on the Levee occasionally is caught in a shower. The Mississippi is at about the same stage last noticed, three feet below high water mark. Of the times in general, we cannot say more than repeat former remarks—the cry of "Hard times!" is in the mouths of nearly all who give themselves any trouble about the matter; and, though we believe them to be hard enough, yet, if our private opinion can shed any light on the subject, we are free to say that they have been rendered doubly difficult by idle clamor. The curtailment of accommodations by the Banks is certainly a great drawback to our commerce, and has reduced the prices of Stocks, &c. below what we thought could be the contingent of a probability; but, if those who have cash idly hoarded, could find firmness to invest it, (and a better opportunity never presented itself since we have known the city,) in one short month, money would, we believe, go a begging for good notes at 10 per cent. per annum. We are aware that many, very many, are of precisely the contrary opinion; and so long as this idea is supported, nay, tolerated by the community, just so long will we have "hard times."

COTTON.—The market has been very lively since a few days, and sales to about 16,000 bales, including portions of every description, have been made at ¼ to ¼ cent. per lb. advance. The operations have been principally in Tennessee and Alabama Cotton, at 9½ a 10 cents per lb. for parcels round. The stock of Tennessee is very small, while that of Alabama is abundant. Of Louisiana and Mississippi there is little left for sale, and fine parcels of these descriptions, in particular, are very scarce. The market has assumed a more healthy appearance than formerly; and, but for the extremely unpropitious weather, would be very animated.

SUGAR continues to command former rates of 5 a 7¼ cents per lb. for that of good quality in the city.

MOLASSES is in the usual good demand, and prices remain without change, 20a21 on plantation, and 23a23½ in town.

FLOUR—The price remains without change, and the demand fair.

PORK is in good demand, and a fair business has been done at the rates quoted.

BACON, as remarked last week, is rather dull, without change in price.

LARD is in good demand, at 6¼ cents per lb. for that of good quality.

LEAD, Pig—There is no alteration in price, $5 12½ per 100 pounds.

FREIGHTS have improved—and, as usual, some are refusing current, and waiting higher rates.

VOL. III. OF THE RAILROAD JOURNAL AND ADVOCATE OF INTERNAL IMPROVEMENTS is published once a week in quarto form, with 16 pages to each number, at $3; or in *semi-monthly* form, of 32 pages, stitched in a cover of colored paper, at $4 *per annum, in advance.* The *first* and *second* volumes of the Journal may be had in *two* parts to the year, either stitched in *covers* or bound in boards, at the subscription price, with price of binding, in one part, 50 cents, in two parts $1 per volume. Those in covers may be sent by mail to any part of the country, the same as a magazine. Published at No. 35 Wall st., New-York, by D. K. MINOR, Editor and Proprietor.

THE MECHANICS' MAGAZINE AND REGISTER OF INVENTIONS AND IMPROVEMENTS is now just commencing its *second* year. It will be continued in a manner altogether *superior* to that of the first year. It has drawn forth many valuable correspondents, in different parts of the country, with the assistance of whom, and those who may hereafter contribute to its columns, together with the ability of Mr. JOHN KNIGHT, formerly, and *for several years*, proprietor and publisher of the LONDON MECHANICS' MAGAZINE, who is engaged as Editor, the proprietor has no hesitation in saying that it will be found worthy of an extended circulation and a liberal support. The *first year*, or *two* first volumes, *having been stereotyped*, may now be had either in numbers, or bound in boards—either at *wholesale* or *retail*. Price $1 50 per vol. in numbers, or $1 75 in boards, or $3 per annum. A liberal discount made to the trade. Published by the proprietor, D. K. MINOR, at No. 35 Wall st. N. Y.

THE NEW-YORK FARMER AND AMERICAN GARDENER'S MAGAZINE, has commenced the *second* volume of a *new series*. It is published once a month, in quarto form of 32 pages to each monthly number, at $3 per annum *in advance*. The last volume may be had either stitched in a *cover*, so as to be sent by mail, or in boards. Price, *stitched*, $3 25; in boards, $3 50. *Each subscriber who pays in advance, or previous to the first of April, free of postage or commission, will be entitled to eight additional pages to each monthly number, or 96 extra pages to the volume.* Published at No. 35 Wall street, N.Y. D. K. MINOR, Proprietor.

Jan. 22, 1834.

A QUARTERLY JOURNAL OF AGRICULTURE AND MECHANICS will hereafter be published at the same office. Each quarterly number will contain about 300 large *octavo* pages, embracing the most *choice* articles from the best *agricultural* and *mechaaical* publications both in America and Europe. It will form 2 volumes to the year, of about 640 pages each, and will be put up like other quarterly publications, so as to be sent by mail. Price, $5 per annum, in advance.

N. B. *A small edition only will be published.*

D. K. Minor also publishes the NEW-YORK AMERICAN, *daily, tri-weekly,* and *semi-weekly.*

Also, the PLOUGH-BOY, a cheap agricultural publication, *of eight quarto pages,* is issued once a week, at $1 50 per annum, *in advance.* It contains much interesting reading upon agriculture, &c.

☞ All Letters and Communications for the above publications, may be addressed, *free of postage,* to

D. K. MINOR.

NOW READY,

AN INTERESTING AND USEFUL MAP.

Upon which is delineated nearly all the Railroads now chartered in the U. States. It is designed to show the *present* contemplated connexion of the different lines, as well as where others may hereafter be constructed to connect with them. It may be had either in sheets, price $1 25, or put up in morocco for pocket maps, price $1 50, or on rollers at $2 25, in any quantity, by applying to the subscriber. D. K. MINOR, 35 Wall street.

New-York, April 2, 1835.